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ABSTRACT

The Canadian Council on Urban and Regional Research has as one of its objects "to assist all efforts throughout Canada to gather, analyse, co-ordinate and distribute available knowledge." In this report the Council makes available the outline of an information exchange service that would deliver the whole range of pertinent urban experience to those who have to understand and manage urban affairs. These proposals are based on the Canadian experience of their three authors who have given much of the past two years to the problems and performance of a Canadian urban information service. The report shows that Canadians of both languages can be far better served than ever before with urban information, whichever the language in which the experience was first recorded. The authors indicate why fuller exchange of urban information is essential to the future of urban Canada, and how the modes of that exchange can be made self-adjusting to the changing needs of Canadian users. (Author/NH)

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Information for Urban Affairs in Canada

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Michel Barcelo
Henry C. Campbell
Dennis A. Young

for Canadian Council
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Foreword

The Canadian Council on Urban and Regional Research has as one of its objects "to assist all efforts throughout Canada to gather, analyse, co-ordinate and distribute available knowledge". In this Report the Council makes available the outline of an information exchange service that would deliver the whole range of pertinent urban experience to those who have to understand and manage our urban affairs. These proposals are based on the Canadian experience of their three authors who have given much of the past two years to the problems and performance of a Canadian urban information service.

The Report shows that Canadians of both languages can be far better served than ever before with urban information, whichever the language in which the experience was first recorded. The authors indicate why fuller exchange of urban information is essential to the future of urban Canada, and how the modes of that exchange can be made self-adjusting to the changing needs of Canadian users.

The studies on which this Report is based were made possible by contributions from seven governmental and other agencies and associations based in Ottawa, provincial capitals and other cities across the country. The project sprang from representations made to us in 1968 that arrangements for sharing urban information, which already existed within certain localities or occupational groups, could be extended and linked to constitute a highly necessary Canadian urban network.

The authors of the present Report are Michel Barcelo (Senior Planner, Service d'aménagement du territoire de la région aéroportuaire, Montréal), H. C. Campbell (Chief Librarian, Toronto Public Library) and Dennis A. Young (Executive Director, Capital Regional District, Victoria, B.C.). They have been ably assisted by Monique Ouellette as Project Officer, with the help of Monique Henri and Carol Clarke. The project has been conducted with the help of an Advisory Panel consisting of information users and experts as well as representatives of many of the agencies that subscribed to the project, presided over by Dr. John Frei of Toronto. The experts and advisers had the benefit of surveys conducted by professionals retained for the purpose, as well as useful comments by many individuals.

The Council is grateful to all who have helped in this effort to perceive and to conceive means for serving Canada with better urban information. The urgency of the issues facing this country in developing and operating our growing cities is clear enough. Canadians have little time to resolve the most pressing issues and we can afford to lose none of the pertinent experience that will help towards the best courses of action. Citizens of all kinds and in every region are involved in urban policy debates; the job of the information network will be to bring them what they need for constructive debate and to transmit their conclusions quickly to the points of decision. The Canadian Council on Urban and Regional Research calls on those persuaded by the logic of this Report to join now in building the kind of urban information exchange network here shown to be essential to sound urban management.

Jean-Marie Martin,
Chairman

Ottawa, March 1971

The Authors

Michel Barcelo

Senior Planner (Urbaniste sénior), Service d'aménagement du territoire de la région aéroportuaire; formerly Professor, Institut d'Urbanisme, Université de Montréal and member of the Planning Department of the City of Montréal; degrees in Civic Design, University of Edinburgh and from the Laboratory for Computer Graphics, Harvard University.

Henry C. Campbell

Chief Librarian, Toronto Public Library; member of the study group on scientific and technical information (*Special Study No. 8* of the Science Council); formerly in charge of bibliographic exchanges in U.N. New York and UNESCO in Paris, before that with National Film Board; author of several books and articles on information and libraries.

Dennis A. Young

Executive Director, Capital Regional District, Victoria, B.C.; former City Manager of Victoria; Past President of the Institute of Public Administration of Canada; elected member of the Canadian Council on Urban and Regional Research.

The Council gratefully acknowledges the co-operation of the Université de Montréal, the Toronto Public Library Board and the City of Victoria which enabled the Authors to engage in this study.

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I. Introduction - The Project

Background and Purpose

Canada is now closer to the beginning of the 21st Century than it is to the beginning of World War II. Solutions to the problems of urban living in Canada are being sought today on every hand. Parents, children, young and old are concerned about the nature of our growing cities, and the quality of urban life.

The key role in determining how our urban areas will develop is entrusted to those who manage them. In the late 1960's growing concern was expressed by Canadian urban administrators that the acquisition and effective use of knowledge and information to manage our cities was a matter that required immediate attention.

The Canadian Council on Urban and Regional Research was approached for funds by several groups interested in looking into the difficulties encountered daily by those having to find and use urban information in Canada. Several government agencies had also been approached for the same purpose. It was suggested that the Council was well placed to invite solutions to the problems presented in the urban information field.*

A symposium was held in August 1968 in Ottawa to delineate more clearly the field of study and define the tasks within it. Experts in the field of information and urban affairs recommended that a study project be undertaken by the Canadian Council on Urban and Regional Research. Its purpose was to determine the main requirements of urban information users across Canada and the potential sources —Canadian and foreign— of this information. The aim of the study would be to present proposals for more reliable delivery and use of urban information in Canada. It should outline sources of information here or abroad useful in Canadian urban management, and recommend methods for improved communication and use of information and data across this country.

* For the purposes of this study, "urban information" is defined in brief as those facts, documents and experiences useful for the management of urban centres and urban regions. A more extensive description is given on page 18.

Participants

1. Funding Agencies

The following organizations contributed financially to the project.

- Canada Council
- Canadian Federation of Mayors and Municipalities
- Central Mortgage and Housing Corporation
- National Capital Commission
- Province of Alberta
- Union des Municipalités de la Province de Québec
- Union of British Columbia Municipalities

2. Study Management Committee, Expert Team and Advisory Panel

Messrs. Eric Beecroft, then Chairman, Meyer Brownstone and Jean-Marie Martin, all Directors, were given responsibility by the Council for the general management of the Urban Information Service project. The three authors of the present report were asked by the Management Committee to form the project's Expert Team: to direct the work of other consultants and to prepare the outline of an urban information exchange scheme which would alleviate the problems found.

An Advisory Panel was formed, composed of persons knowledgeable in the area under study or representative of the funding bodies. Their comments and criticisms throughout the project have been of great help in focusing on the users' requirements and finding solutions to their problems. Names of members of the Advisory Panel are listed in Appendix A.

Methodology of Study

A detailed explanation of the methodology used in the study can be found in Appendix B. Suffice it here to say that under the direction of the Expert Team, surveys of current information users' requirements and sources in Canada were carried out by Kates, Peat, Mar-

wick & Co. of Toronto, and of retrospective and foreign urban information sources by Mrs. Cynthia Bled, B.A., M.A. (Econ.), B.L.S. The survey of users' requirements involved interviews in a structured sample of over 120 Canadian units of urban administration; of these, 92 were in municipal offices distributed across the five major regions of Canada and using both official languages, while the others were provincial, federal and academic. Responses of urban information users revealed their habits and difficulties and particularly, in the few cases where a whole municipal administration was studied, something of current costs for seeking, interpreting, processing and transferring urban information within and among municipal administrations. The chief difficulties and defects in present practices are clear enough from these surveys to enable performance specifications for a Canadian urban information exchange service to be essayed.

Value of the Survey Findings

The surveys of users' needs and of sources were indicative of the situation of urban information in Canada. In drawing their conclusions, the authors took the results of these surveys into consideration, relying largely, however, on their experience and knowledge of this field complemented by comments from members of the Advisory Panel. Rather than a statistical report, this study is an evaluation of the difficulties faced by urban information users, and presents recommendations to improve information transfer.

From the surveys of users and sources, and with the help of the Advisory Panel and other persons, a plan has been proposed for a Canadian urban information exchange service. Such a service could deliver to those using either official language in every branch of urban affairs, in communities of all sizes and in every region of Canada, the benefits of quicker, more complete and pertinent information on which to base decisions affecting millions of Canadians. A Canadian urban information exchange network on these lines would also serve most of the needs of Canadians in teaching and research institutions and in the private sector, insofar as they are involved in urban matters. It would also facilitate a better informed participation by individuals and citizen groups in the government of their cities.

Priorities for Action

The analysis of the data gathered during the course of this study has given rise to a long list of recommendations. These involve all levels of government, universities, municipal and other associations, industry and commerce, and even the individual citizen. It is the view of the writers that unless action is taken in certain fundamental areas little is to be gained here by extensive elaboration of detail. As a consequence the following five *priorities for action* are presented with the hope that all will be acted upon.

1. The Responsibilities of Municipal Administrations

There is ample evidence of duplication of effort among department in municipal administrations in the collection, processing and distribution of information both for official use and for the use of citizens. Individual municipalities must develop more adequate and more effective internal information services.

Key steps to be taken are the development of adequate criteria to guide those who are setting up new information gathering, processin and distribution tasks; the meshing of existing separate information systems; the reduction of obsolete services; and the improvement in the quality and accuracy of existing services.

Of particular importance is the adoption of standards that will pe mit any department of a municipal government to use information collected by another department.

2. Need for Qualified Information Staffs

Municipal officials and elected representatives must recognize the specialized nature of the information handling process together wit the need for and value of qualified personnel working in this field. This need can be met by the hiring of specialist information officers and by in-service training programs. The availability of such specialists for municipal service is extremely limited at the present time, largely as a result of the lack of recognition of need for their service Municipalities and other levels of governments must follow the lead

of business and universities in developing courses aimed to prepare information specialists for municipal service.

3. Intermunicipal Co-operation in Computer Use

Local government agencies within geographic or economic regions must work toward the orderly and efficient use, on a co-operative basis, of computers and other automated equipment. Independent studies clearly support the technical soundness and economic feasibility of shared central computer systems which can provide significant improvements over present methods of information handling. (See Appendix G.) It is no longer a matter of choice whether or not use should be made of computers and machine methods in information handling. Substantial improvements can be achieved only by adopting such means.

4. Cost of Municipal Information

As all Canadian municipalities now appear to be spending up to about one-seventh of their annual operating budgets on information collecting, processing and transfer, and as this spending seems to be increasing steadily, it is essential to measure information handling requirements against expenditures as accurately as is the practice with other areas of governmental activity. Municipalities must direct more effort to determining what should be spent to provide the quality of information necessary for competent decision-making in the field of urban management.

5. Establishment of a Network and Clearinghouse for Information Exchange

The Canadian Council on Urban and Regional Research, in its already well accepted role as a concerned initiator in the field of urban affairs, should convene, as soon as possible following publication of this report, a conference of representatives of concerned bodies including municipal associations, post-secondary teaching institutions, professional societies and the like together with spokesmen from the main governmental producers and users of urban information. The basic material for consideration at such a conference would be this report and the chief object of the consultation would be to lay the groundwork for a Canadian network and a clearinghouse for urban information exchange.

In the opinion of the authors of this report the functions of this clearinghouse would be:

a. to serve as a point through which to reach information on urban information wherever it may be located in Canada, for access and delivery in the users' language whether the original be English or French;

b. to facilitate and encourage the standardization of urban information gathering, processing and dissemination to meet the needs of Canadian users;

c. to serve as a focus and resource to aid regional groups, individual municipalities and special bodies to set up their own urban information networks and subnetworks; and

d. to act as a link with urban information clearinghouses and exchange services outside Canada.

At the time of this conference a plan should be adopted for the financing of the first two years of operation of the Canadian information exchange network and the central clearinghouse services. In order to meet the cost of these services, participants in the network should be prepared to subscribe an agreed percentage, say 2%, of their total information costs (or 0.3% of their whole budget) to the operation of the network and clearinghouse services. If even 1% of their present cost of information were subscribed by all Canadian municipal bodies, the sum available would amount to more than $3 million a year. This amount would meet the running costs of supplying the necessary communication services, guides and directories to sources and information services, whether local, regional, provincial, Canadian or international.

II. Urban Information Needs of a Growing Urban Canada

The Growth of Urban Canada

Our concept of "urban information" includes all the knowledge used or the management of urban areas; we shall spell this out further at he end of this chapter, after looking at the features of urbanization n Canada. The specific nature of urban areas can be defined in demo-raphic terms (number and density of people), in economic terms prominence of secondary and tertiary production), or in social erms (way of life). Thus, we are not limited to "municipal informa-ion", to the concerns only of the local level of administration con-eived as a jurisdiction to manage a municipal area. In Canada many nunicipalities, whether by the definition of the Dominion Bureau of tatistics* or by their legal status, are rural rather than urban. Table on page 14 shows that, of the 4,000 and more municipalities of anada, about half are incorporated in such a way that they could e considered "urban", and only about 1,000 are considered ur-an by the Dominion Bureau of Statistics. From the Table, it can also e seen that the territory of certain "urban areas" is composed of nany municipalities: the 30 "major urban areas" of Québec and On-ario were under the jurisdiction, in 1966, of 183 municipalities. A municipal" concept of information coincides only in part with what s here regarded as "urban information".

Urban areas, rather than municipalities, are of concern here because see Chapter IV) the organization of information required for their nanagement has not developed in step with the phenomenal urban rowth of Canada. From 1851 to 1961, while the total population of anada increased sevenfold, the urban poulation increased almost orty times and especially in urban areas of 100,000 and more eople. This rate of growth did not permit the acquisition of neces-ary knowledge as fast as it was required to solve the problems that rose. Some of these problems were late in being identified as "ur-an", after they had consistently appeared in urban environments.

Each Province of Canada has its own specific urban arrangement: e.g. Manitoba with the majority of its urban population in one urban area, or Ontario with its complex hierarchy of urban centres of different sizes (Figure 1 and Table 2). In most Provinces, the urban populations are concentrated in a few urban areas; according to the 1966 Census every Province, except Ontario and Newfoundland, had more than half of its urban population in one or two urban areas.

The limited number of sizeable urban areas is concentrated in even fewer main urban regions: the Great Lakes axis and the St. Lawrence Valley in Ontario and Québec; the Lower Fraser Valley in British Columbia; the Assiniboine and Red River Valleys in Manitoba; and the shores of the Atlantic and the Gulf of St. Lawrence in the Atlantic Provinces. "Urban and regional information" in Canada can thus be conceived of, in the main, as the sets of knowledge required for the management of less than 50 urban areas, in about 10 principal urban regions. The complexity of their management is increased by the fact that the 42 major urban areas identified by the 1966 Census were made up of some 200 cities and towns, 30 villages, and about 100 other territories of local administrations: townships, parishes, counties, etc. A supply of urban information to meet the needs of these will serve well the rest of urban Canada.

Every day, individuals and families move across the artificial boundaries separating these administrative units, whether for daily migrations or for a more permanent move to a new dwelling or new employment. These migrations help in the diffusion of "urban" life, culture and economy throughout the urban areas and account for each being regarded as a single labour market and housing market. The demand for public services is based less and less on artificial administrative boundaries and more and more on metropolitan or region-wide expectations as to urban life and the urban environment.

Urban affairs and urban management are proportionally as important for French-speaking as for English-speaking Canadians, for both groups are urbanizing at similar rates. Moreover, the concentration of the French-speaking urban population (nearly one-third of the urban population of Canada) in Québec has already helped in creating important traditions of urban management almost exclusively in the French language. In the major urban areas of the Province,

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The Dominion Bureau of Statistics defines as "urban" those cities, towns and illages, whether incorporated or not, having a population of at least 1,000; ertain urbanized suburbs are also included in this definition.

Table 1. Proportion of "Urban" Municipalities

Distribution of Local Municipalities, 1966[1]	*Nfld.*	*N.S.*	*P.E.I.*	*N.B.*	*Qué.*	*Ont.*	*Man.*	*Sask.*	*Alta.*	*B.C.*
1. Incorporated cities, towns and villages	63	42	28	29	555	346	86	496	269	98
Over 1,000 population	46	40	8	27	348	250	36	60	76	67
Located in CMA[a]	2	2	—	2	89	47	9	2	3	8
Located in MUA[b]	—	6	—	2	28	19	—	—	—	—
2. MUA	—	1	—	1	8	13	—	—	—	—
3. CMA	1	1	—	1	2	7	1	2	2	2
Types of Local Administrations, 1968[2]										
1. Local municipalities	164	66	30	114	1,651	925	213	803	372	140
Cities and towns	65	42	8	27	250	190	45	141	110	44
Villages and "others"	99	24	22	87	1,301	735	168	662	262	96
2. Regional municipalities	—	—	—	—	75	39	1	—	—	25

a. Census Metropolitan Area, according to DBS definition
b. Major Urban Area, according to DBS definition

1. Source: DBS 92-607
2. *Canada Yearbook*, 1969, p. 102

almost all the internal exchange of urban information is in French, and such elements of this experience as are "exported" in English are usually translations from French originals. From the strict point of view of information exchange, lack of knowledge of these facts would deprive English Canada of the knowledge of useful experiences of urban Québec and vice-versa. Furthermore, the right of Canadians to use French as well as English as a working language and in official communications is being recognized in other Provinces. It would seem appropriate to consider as a priority the recognition of this rig in urban information and urban management, as much in view of th importance of urban affairs as in view of the importance of the urba population of Québec.

Table 2. Urban Areas and Percentage Population by Province

Province	*Number of large urban areas*	*% of urban population*
Ontario	20	82 %
Québec	10	78
Nova Scotia	2	57
New Brunswick	2	56
Alberta	2	71
Saskatchewan	2	53
British Columbia	2	60
Manitoba	1	77
Newfoundland	1	35

The Importance of Urban Affairs

The issues accompanying growth in size and complexity of the urban environment command public attention. The individual elector often feels that he is up against an incomprehensible system, not knowing where to look for solutions to apparently simple problems. For the slightest bit of urban information he often has to knock at a dozen different doors, sometimes in vain. This kind of experience can lead to a distrust of government as such, or to new organizations meant to by-pass the frustrating "established channels".

Many of the urban electorate, actively concerned, are gathering in voluntary bodies to be heard not only by City Hall but also by other levels of government before major decisions are taken regarding their urban area. The individual and collective needs of citizens for information on their urban area and on the objectives and programs adopted by public authorities are becoming more demanding and less easily satisfied.

In this study we have not attempted to deal with the organization of citizen information services in urban areas, many of which are being established by both public and private groups. Such services will by their very nature draw on the same sources that urban managers and specialists have established to help them in their decision-making. If an adequate and effective functioning exchange service of urban information in Canada is created, and if it is designed to ensure that citizens' information needs are taken into account, then citizens' groups can be served by it as effectively as urban managers in the narrow sense.

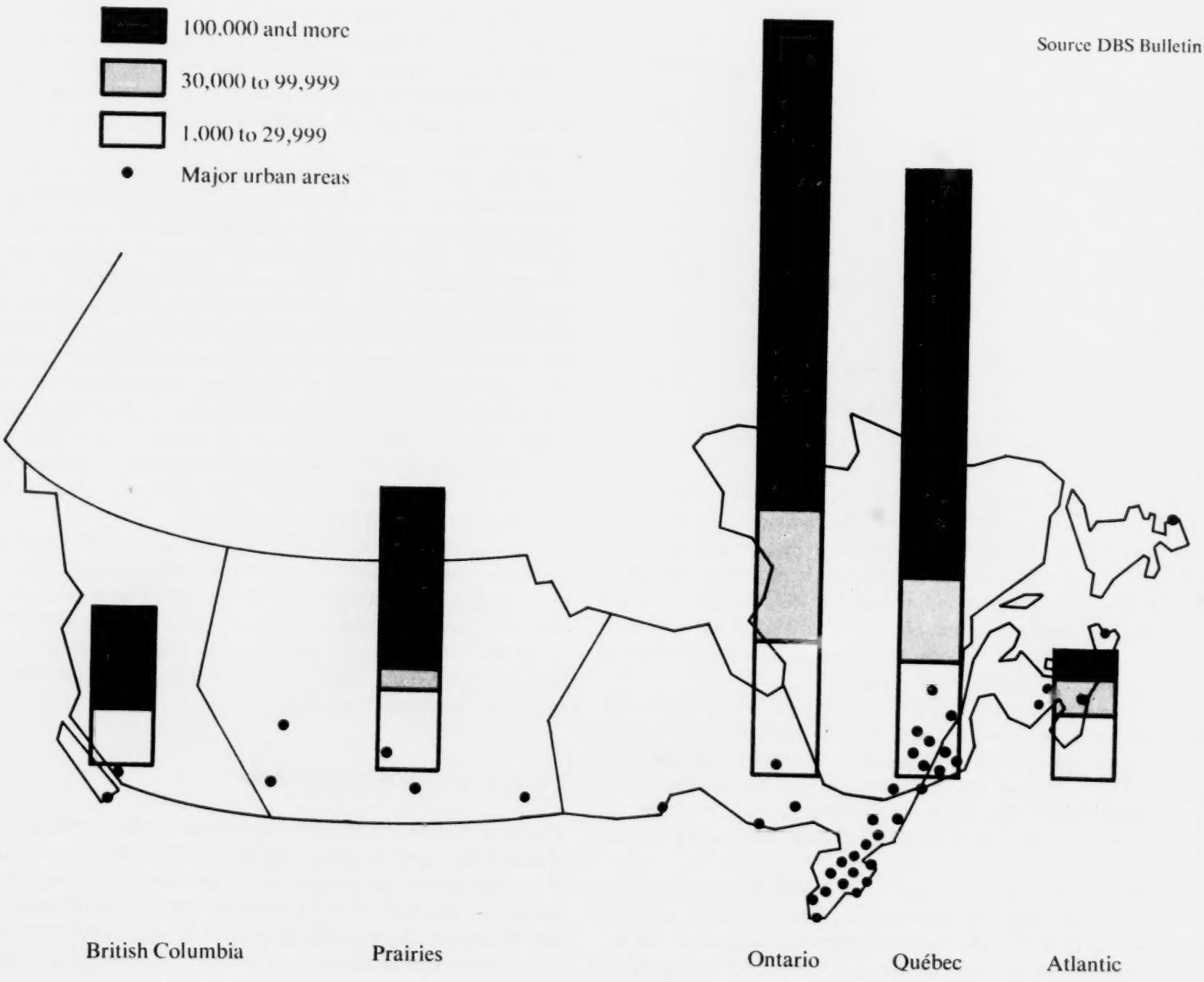
The increase of interest in urban affairs is reflected in all the information media, as can be seen by scanning the program listings for Canadian broadcasts in the late 1960s in contrast to those of a decade earlier. It is shown too in the growth in urban journals (e.g. *Plan Canada*, *Habitat*, etc.). The same kind of evidence is available from the content of the daily and periodical press, with a rising frequency of urban topics. The indexes of the Canadian learned journals show the same rise in concern with urban subjects. *Urban & Regional REFERENCES Urbaines & Régionales*, published by the Canadian Council on Urban and Regional Research, listed about 1700 documents from the period 1945-62 in its first issue. The issue for the year 1969 contains over 1,000 entries, and the record for the period 1945-69 runs to a total of about 7,000 items, revealing a steep rise in the output of urban documents in Canada.

A similar development of urban studies as a specific field of activity has taken place in Canadian universities and colleges. Ten years ago there were a few academic centres concerned with urban problems and but a handful of minor courses in urban affairs. The 1970 edition of CMHC's *Opportunities in Canadian Universities for Education in Urban and Regional Affairs* runs to 221 pages and mentions 70 post-secondary teaching institutions.

The Management of Urban Affairs

The expansion of traditional "municipal" services and their reorganization at the level of urban and metropolitan areas and regions lead as a consequence, in Canada, to the creation of new administrative structures. Examples are the metropolitan administrations of Toronto and Winnipeg, the regional districts in British Columbia and the urban communities in Québec. In addition, the federal and provincial

Figure 1. Urban Population by Size of Urban Areas and by Region, 1966



Source DBS Bulletin 92-6

vernments are assuming greater responsibilities in the fields of alth, welfare, housing, education and environmental control. he establishment of the new regional level of administration can be nsidered as an attempt to render better services, fairer revenues and sier credit for urban populations, and also as answering the need r pooled information about this new kind of human settlement. It is statutory responsibility of each of the three new Urban Communis of the Province of Québec to establish data processing, census and sessment services. The Metropolitan Winnipeg Act of 1960 conned a provision aimed at improving Winnipeg's research and inrmation transfer.

his acknowledges that metropolitan provision of information serces is essential to regional administrative efficiency. Whether imsed or voluntarily agreed to, the same kind or regional information oling is essential in every urban area of Canada, so that decisions fecting the whole area can be based on a common stock of relevant cts and experience.

t would be a delusion to believe that the creation of new urban risdictions and the hiring of new personnel will by itself solve urban oblems. Efficiency depends not only on numbers and qualifications staff, but also on optimum exercise of their professional compence, including adequate knowledge of the problems to be solved, available resources and solutions, and of criteria to assess results. It apparent that a great part of the working time of urban civic servants spent trying to organize their information base for decision-making. is therefore particularly important to eliminate waste (time spent oking in the wrong place or for nonexistent information, time spent different people in collecting or processing the same information, time spent on independent and contradictory efforts so that related formation is collected and processed in forms that cannot be used combination).

'Urban government" has become more far-reaching and intricate in e roles it is expected to play. Local and regional authorities are now ctive in such fields as air, water and soil pollution control; codes overning the quality of housing and investment in housing for lowcome families; urban renewal schemes to accelerate the pace of nd use change; the provision of a vast array of recreational and cultural facilities; and economic development and industrial promotion, to name but a few. Involved in so great a range of activities, those responsible for urban management have to identify more clearly the relationships between social planning, economic planning and physical planning of urban areas. They have to take into consideration not merely the immediate or short-term effects of daily decisions, but also the net advantages on a long-term basis of various policies on land use, taxation, urban transportation, etc. Morever, these policies can be the result of choices defined by more than one level of decision-making (federal, provincial, regional, municipal) requiring continuing and intensive efforts in integration.

Coping with these new problems has resulted in the development of new methods and techniques of urban management, such as "cost-benefits" and PPBS (Planning, Programming, Budgeting Systems). These techniques are extremely demanding in terms of the quantity of data, the competence of personnel and the complex equipment used for information processing. Moreover, such techniques stimulate clearer definition of goals and objectives; better judgment of the policies and programs required to achieve these objectives; and a more thorough preparation of the information needed to support rational administration.

Urban Information Use in Urban Government

Categories of Urban Management Information Users

The "agents" of urban management can be grouped into four categories. These categories are neither static nor mutually exclusive: agents belonging primarily to one category may well be responsible for functions of another. Moreover, in the course of his career an agent may shift from one category to another. However, the following division of responsible agents may be helpful in determining the information needs of different management functions:

a. *elected representatives* who are, in the last resort, responsible for the management of urban affairs. Other officials are under their direction and urban management depends on a continual transmission

of information and knowledge among them all;
b. *administrative generalists* who are the highest level officials: heads of administration, and their immediate assistants;
c. *administrative specialists* who are responsible for the management of specialised agencies or services: those who direct public works, health, town planning, police departments, etc.;
d. *specialists in a single function* who, within specialised agencies, perform essentially professional or technical tasks: engineers, architects, accountants, doctors, lawyers, etc.

Although in this last group, the professionals have specialised networks of information within their discipline or profession, they also need access to "urban" information from other sources. Their specialised sources and networks do not give them the necessary instruments of communication with the agents in other branches of urban management; such communication requires knowledge specifically oriented towards urban problems and programs; this can be quite different from the very specialised knowledge required within one discipline, profession or technique. Often the specialists themselves must make this transfer of information from their specialised sources for the benefit of non-specialists working in the same urban area or in other echelons of urban administration. As the nature of transfer is determined by the objectives and framework of urban and regional programs and services, the efforts to collect, recast, and interpret highly specialised knowledge, to make it available and useful to other agents, is included in our concept of the handling and use of urban information.

The elected representatives and administrative generalists must, in their efforts to plan and control urban programs and services, see to it that scarce resources, human and financial, are allocated and used as rationally and efficiently as possible. In addition to a general knowledge of management techniques, they also want to know about resource allocations used in other similar urban areas.

This information can only result from multilateral co-operation among officials responsible for urban and regional management. At present, no information exchange service is responsible in this area for the whole of Canada.

The Specific Nature of Urban Information

Essentially, the components of our definition of urban information can be summarized as follows:
a. carrying out the tasks of urban management involves a considerable manipulation of data and facts. These data, although not always processed, aggregated or edited in a useful way, are a potential source of information for *urban management;*
b. many of the activities of urban government require coherent set of knowledge gathered for the purpose of furthering the *implementation of programs* specific to urban areas;
c. information *specific to a scientific discipline or profession*, available to certain specialised agents of urban and regional management through their own specialised networks, must often be restructured to be useful for urban management;
d. continual exchanges of information about the management of *other urban environments* is required at the top levels of urban government.*

* Traditional types of urban information systems, e.g. bibliographic, management, research information systems etc., are identified in "Cost-Benefit Analysis of Urban Information Systems", by George Leyland, in *Urban and Regional Information Systems: Service Systems for Cities*, Papers from the Seventh Annual Conference of the Urban and Regional Information Systems Association 1969.

II. Present Use of Information in Urban Government

lthough this chapter relies mainly on the results of the survey of unicipal and governmental users' urban information needs, we have dded to this source material our own interpretation of problems entified, based on more general considerations of the efficiency of ublic and private decision-making in urban Canada.

formation Needs of Municipal Management

here is no "typical user" of urban information. Practices vary acrding to the field of activity, the complexity of the task, the degree professional qualification of those in charge and the size of the unicipality concerned. From the results of the survey we can say at:

the geographical extent of the search for information corresponds th city size, while internal information processing and exchange bome more exacting in large agencies;

as the level of administration becomes more general, more imortance is given to broader combinations of information, condensed om a very wide range of knowledge and experience, both local and ternal, as against the very selective forms of information used in ecialised agencies; and

the activity of an agency when carried out by professionals in the ld demands more varied intake and intensive internal processing of formation, resulting in heightened awareness of the value of inforation.

The more clearly the urban administrator recognizes the complexity decision-making, the more he feels the need for the best possible formation. It is evident that the majority of the decisions in certain encies are based on internal, almost "private" information, of which change with others is neither frequent nor seen as imperative. It is ually evident that for other agencies, required knowledge comes at nes from sharing information extramurally, at other times with prite firms and often with private citizens.

n setting up an improved information exchange network, each ency must establish clear policies with respect to confidential information. Rather than the reverse, the general rule of governments should be that all information be considered public unless confidentiality is openly proven necessary. Not only is this rule more consistent with the citizen's democratic rights but pervasive confidentiality brings about a drying up of sources as an act of reprisal against the refusal to make information available.

Administrative heads of municipalities (city managers, chief commissioners, "directeurs des services", etc.) revealed in the survey the great diversity of their information needs and the wide range of data and knowledge required both for short-term and for long-term decisions. Urban planners also revealed wide-ranging needs, and we have given special emphasis to their requirements and those of administrative heads.

As persons responsible at the municipal level for the total management of the urban community, administrative heads use the widest range of information sources, as will be seen in Chapter IV. Figure 2 shows in very simplified form the linkages a city manager or other administrative head establishes to meet his functional information needs, as reported in our consultants' survey. This Figure illustrates the practice of top urban administrators in the integration, co-ordination and analysis of the largest amounts and most diversified kinds of urban information. In smaller municipalities, the only top administrator may be the mayor, without the assistance of "administrative generalists"; he may have great difficulty in achieving a similar level of awareness and use of existing urban information.

Staff members of municipal planning departments and other urban planners need formalized channels to obtain information; they have to store, retrieve, update and manipulate large amounts of data obtained from staff and other surveys and from very diverse data sources. They must work simultaneously in the fields of "urban development", "urban planning" and "land use control". Because of this overall perspective on the urban scene, both as a territory and as a socio-economic matrix, urban planners are generally the most omnivorous municipal consumers of urban information. They must obtain information not only on government policies, but also data of all kinds (climate, topography, geology, demography, economic base, population, income, employment, education, property values). Deter-

Figure 2. Information Exchanges, Administrative Head Function

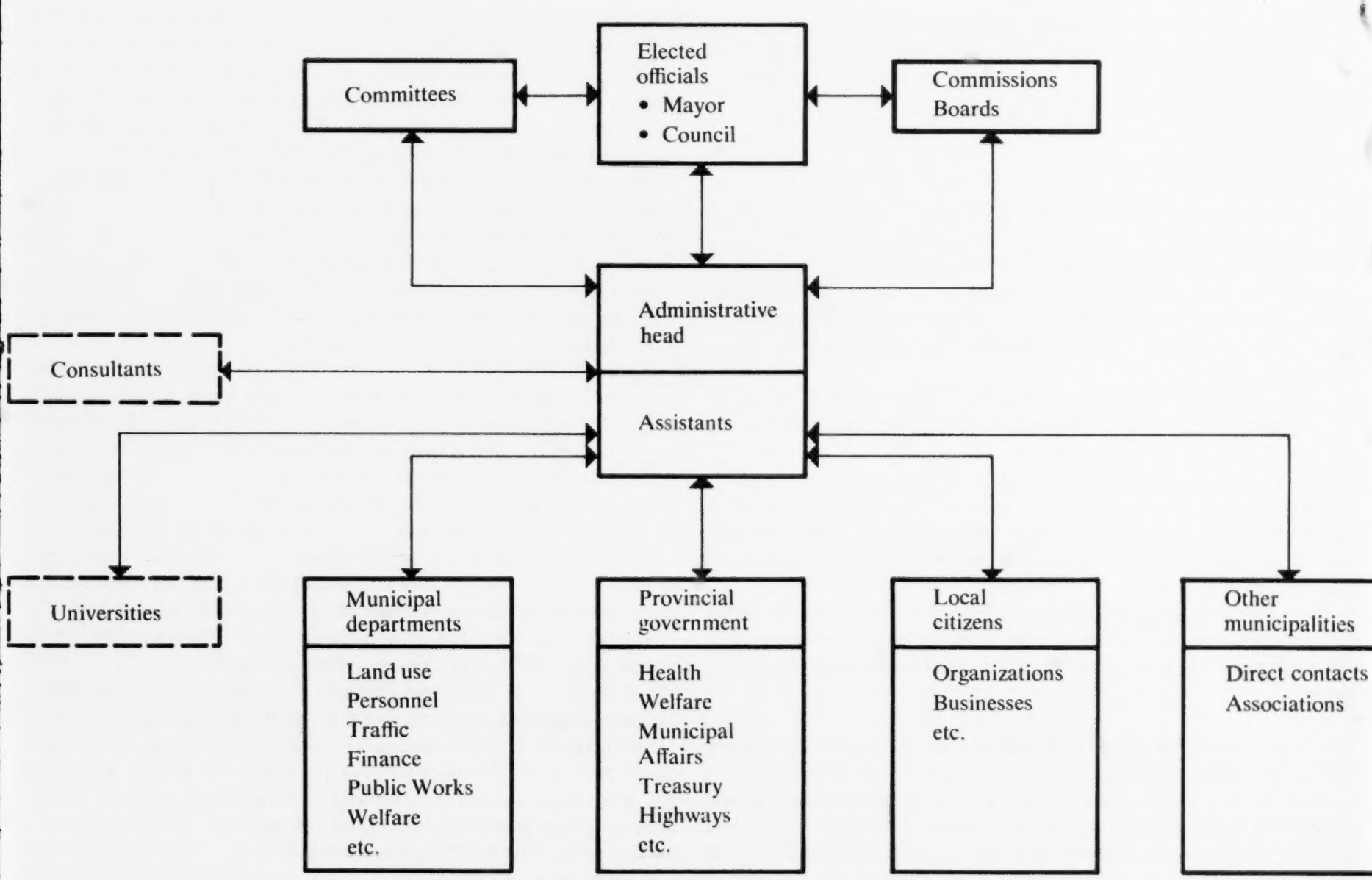
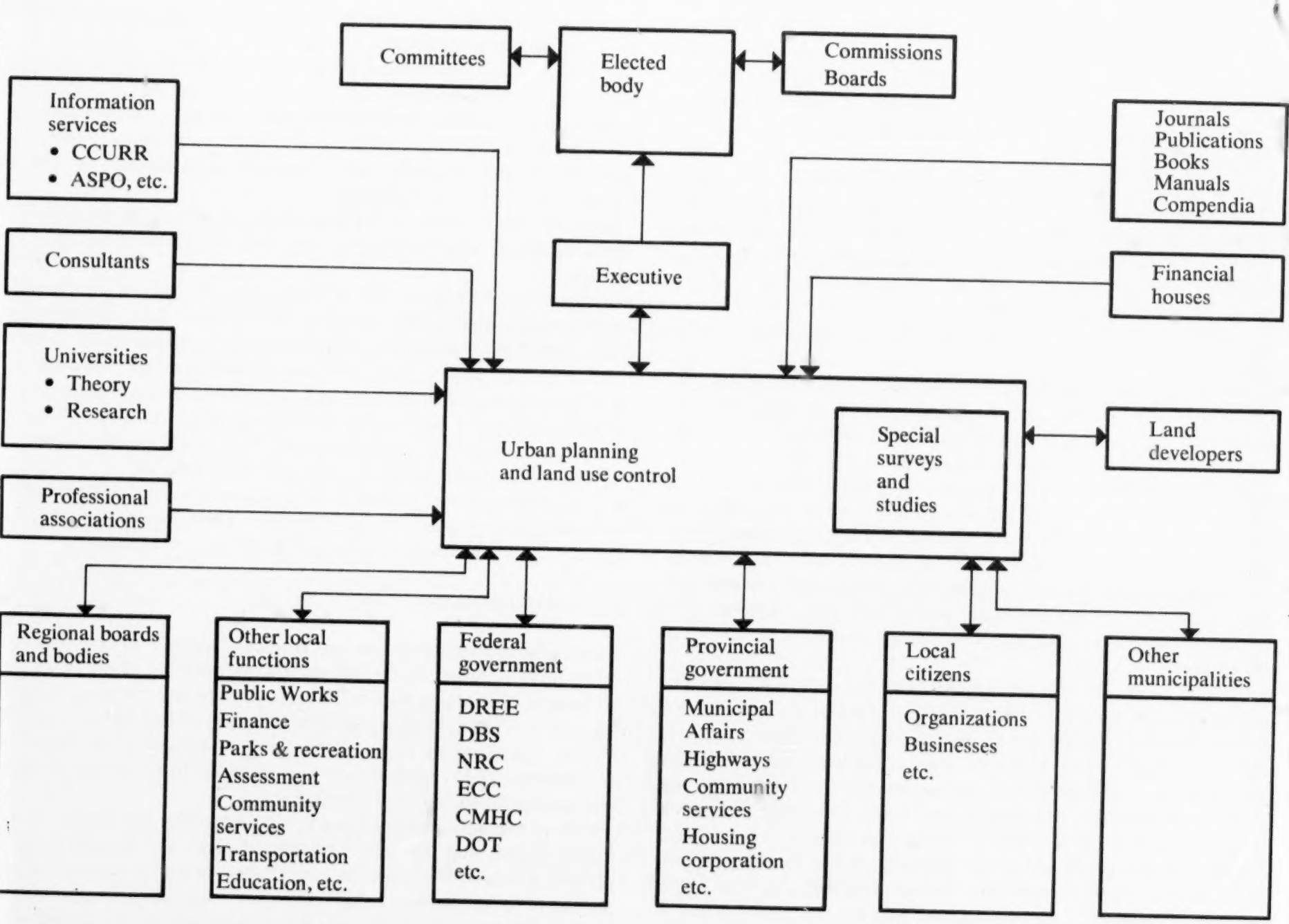


Figure 3. Information Exchanges, Urban Planning Function



(Alphabetic abbreviations are identified on p. 57.)

mining the use of public and private urban lands and the volumes of accommodation upon them is a highly specialised form of social control, aimed at resolving or avoiding problems stemming from the constraints of urban living (including the demand for sites, the density of uses and occupations, and the resulting conflicts).

The welfare and education departments surveyed demonstrated a need for a good deal of socio-economic information on the urban environment. Such needs can be related to those of urban planners, but the emphasis on certain parts of the urban environment or specific groups of the population leads to independent information systems which are often incompatible. An interrelationship of the systems would allow for a shared knowledge and joint interpretation of the city and its needs, in the fields of physical planning as well as of personal citizen development.

In view of urban planners' information needs, their orientation towards large "data banks" is not surprising. However, the planning of spaces and their uses, though concerned with all urban activities, is but one aspect of the general management of urban areas. The frequent isolation between urban planners and administrative heads, in their search for information and data, can lead them to overlook possible sharing and multiple use of such data. The establishment of a great number of partial "data banks" oriented functionally towards the management of separate services on a short-term basis can impede useful information exchanges just as seriously as attempts to set up large "total data banks" oriented solely towards long-term physical planning.

Figure 3, similar in content and source to Figure 2, but applied to urban planners, shows the linkages urban planners must establish for their information, which are at least as complex as those of the typical administrative head. Linkages and sources identified in both cases are so similar that they confirm the importance of solving jointly the information problems of administrative heads and urban planners if only to reduce the duplication of linkages foreseen.

Administrative heads and urban planners, as well as other professional and technical departments, indicate that only the large municipalities can afford their own adequate technical information and documentation services. Smaller municipalities often depend on the larger ones as sources of innovation and information, although this may not be the wisest course.

To rely on the experience of others can ultimately entail a univers repetition of the same ideas and techniques, unless care is taken to apply real innovations resulting from other systems of knowledge ar other methods of problem analysis. Yet the smallest municipality, with limited staff, evidently cannot itself afford to evaluate the full range of methods and knowledge.

From the survey results and the preliminary analysis of the consultants, problems identified can be classified into three important groups:

a. general knowledge or sets of knowledge: this type of informatio corresponds to the general question, "What can be done and how ca it be done?" It is the accumulated knowledge gathered from researc and experience all over the world and applied to urban problems.

b. the exchange of knowledge and information between governments: this type of information corresponds to the question, "What are others doing? How are they solving their urban problems and how can their problem-solving and experience help us?"

c. local and regional pooling of information and data: this type of information corresponds to the question, "How does the situation our urban area and region affect our problems and decisions?"

1. Sets of Knowledge

Mayors, administrative heads and municipal finance officers require this type of information for the general management of urban affair At present, the information available is too vast and too general, lack ing synthesis and editing. Some officials surveyed had only a margin interest in making use of periodicals and conventions of municipal associations. They regretted their lack of access to knowledge of theo ries, policy, financing and assessment.

Some of the most technical and specialized urban employees, as in public transit, land use, public works and parks and recreation, com plained of a lack of knowledge about practices and procedures that proved effective elsewhere. Others, in for example highways and welfare, felt the need for sources which were specifically Canadian

nd specifically urban. Those involved in the most technical functions, at whatever level of government, complained of difficulty in ocating sources and special consultants and of the lack of library and ibliographic resources. Finally, the servants of public transportation, nd use, public works and highways complained that periodicals and ocumentation were too superficial and the vast technical information vailable lacked synthesis and selectivity.

A commonly observed defect is the want of statistics for small georaphical units of the urban agglomeration. As will be seen in Chapr IV, the Dominion Bureau of Statistics is attempting to solve this roblem by geo-coding urban Census data for major centres by block ronts. But there may still be problems caused by the infrequency of he Census and the delays in publishing such data. The solution to uch problems cannot rest with one party alone. Criticisms directed owards the Dominion Bureau of Statistics by the survey respondents oint very clearly to an urgent need to co-ordinate, by geo-coding nd otherwise, the considerable amount of data collected much more requently by all municipal services and government departments: by ssessment, taxation, permits and inspections in particular.

. Exchange of Information Among Urban Governments

t the level of mayors, urban planners and those responsible for ransit policies in various municipalities, there have been complaints egarding the information received from provincial and federal govrnments especially as regards objectives and aims. In cases where hese had been defined, they often had not received adequate publici-. Other complaints which often have been heard dealt with the imossibility of comparison between municipalities because methods, riteria and definitions were not standardized (public transportation, arks and recreation, finance, police, welfare, provincial and federal overnments), the lack of information and data (managers, public ransportation, parks and recreation, provincial and federal governents) and too great a delay in comparison (personnel, provincial and ederal governments). Two municipal services, assessment and police, mphasized particularly the lack of exchange of experiences in elecronic data processing. Public works and parks and recreation in large cities are asked for a great deal by smaller municipalities but receive very little from them.

3. Local or Regional Pooling of Information and Data

Land use, parks and recreation, welfare, education and government officials felt that the lack of local and regional co-ordination in the gathering and processing of data was an important cause of difficulties. Their complaints dealt mainly with **(a)** the lack of socio-economic and demographic data dealing with urban region; **(b)** the need for standardization and regional co-ordination in data gathering, both within and among municipalities; **(c)** the lack of co-ordination of computer services; and **(d)** the incompatibility of data processing programs and equipment.

4. Problems of Provincial and Federal Governments

Provincial and federal governments as well as municipalities have serious urban information problems. Departments of Municipal Affairs note a wide range of major information problems extending from lack of historical data to communication difficulties with units of local government. Other information problems reported include the following:

a. municipalities are often slow in submitting their annual financial reports to provincial offices. This occurs as small municipalities lack competent staff to provide financial data in the manner requested by the Province and delay production of annual summaries;

b. planning horizon of municipalities in financial areas is often limited to one year;

c. computerization of the processing of financial statistics cannot be done due to inadequate quality of financial data. More education of local officials will be required before computers can be well used;

d. there exists a lack of qualified staff relating to information handling;

e. substantial changes in municipal administrative structure and procedures (regional government implementation and provincial assessment takeover) in some cases have altered the conventional chan-

nels of communications with municipalities, and have temporarily hampered information exchange.

The Regional Development Branch of the Ontario Department of Treasury and Economics listed the following problems:

a. the Branch relies heavily on the Dominion Bureau of Statistics, but there is a lack of data for small geographical units, particularly outside large urban areas;

b. data on employment are particularly deficient, especially at the township level, so that mailed questionnaires to local industries often had to be used;

c. data on migration within the Province are nonexistent except for ten-year periods as furnished by the federal Census;

d. information on ethnic groups is extremely scarce, both provincially and for specific regions;

e. detailed data on income are not available in sufficient detail and only in Census years;

f. current statistics on housing, education and retail trade are deficient. Changes occur so rapidly that data two or three years old are actually misleading.

A provincial Department of Highways complained of:

a. the lack of comparative data on municipal expenditures by function (e.g. traffic, health, education, etc.);

b. the need for special series in areas of demography and socio-economic studies at a micro level. The Dominion Bureau of Statistics information is not sufficiently fine-grained.

Hydro-Québec pointed out that most useful municipal data from its point of view are found in the assessment roll of each municipality. However, there are many difficulties in the understanding and interpretation of different systems of assessment and taxation in Québec municipalities. There is a lack of comparable data on assessment and taxation throughout the Province, which makes overall planning difficult.

The Ontario Housing Corporation sees its work obstructed by the following problems:

a. data on income are particularly deficient and out-of-date;

b. local data on employment are lacking;

c. the available range of socio-economic variables for households is inadequate;

d. information on serviced lots is difficult to obtain from local records;

e. generally, the smaller the centre, the worse the data problems;

f. the research group often has to take additional time to carry out its own surveys.

To evaluate the economic impact of urban problems at the federal level, the Economic Council of Canada will require:

a. standardized data on municipal financing capability across Canada (i.e., tax base);

b. the expenditures of the three levels of government: in this area, time series data will be essential;

c. variations in cost of services according to climate, geography, etc.;

d. comparable standards of service.

Knowledge of these variables is needed to control the growth of shared-cost expenditures:

a. municipalities are particularly deficient on detailed information relating to social services;

b. there is a lack of information on municipally controlled utilities which may be substantial revenue sources for those municipalities concerned;

c. aggregate information, such as amount of garbage collected per capita, when supplemented by other variables, should become more comparable;

d. mechanisms for informing municipalities of policies and programs of federal and provincial governments are inadequate;

e. there is a great need for information, particularly in the following areas:

- financial data
- measures of levels of service
- social indicators.

Again at the federal level, the Urban Transportation Development ction of the Department of Transport indicates an interest in information on:

access to airports;

demand-activated bus systems and other new types or urban nsportation;

improvements in existing transit systems in terms of efficiency;

movement of all goods inside city limits (i.e., trucking).

n the private sphere, the urban research centre of a large Canadian iversity outlined the following problems:

communication among academics in the area of urban research is dequate;

there is also a serious lack of exchange between municipalities d universities. There is considerable potential for co-operative stues, but few mechanisms or structures to facilitate interaction;

assessment data are very poor and consequently little used.

The following are their comments on an information service:

geo-coding will be an important element in urban information change;

data banks should not be general, but assembled for specific requirements.

omparisons

he problem of comparative data is evident at all levels of government. From our survey, we learned that some 18% of all respondents are doing extensive comparisons of information with other agencies. Sixty-one percent of all the respondents are doing little comparison. The following reasons were given to explain this:

available data not relevant to their operations;

difficulty in identifying appropriate sources;

comparisons are expensive and time-consuming (involve letters, elephone calls and actual visits to sources);

d. lack of time and lack of support staff to handle information comparisons;

e. incomplete information in terms of:

- definition
- time points
- geographical units
- timeliness
- reliability
- form

f. lack of interest or awareness.

Urban Information Problems

Coming back to our four-point definition of urban information on page 18, we must recognize the following problems: **(a)** the many partners in urban government have not yet established mechanisms that would allow optimum use of the considerable amount of data they collect and do not aggregate, process, analyze or edit in a way useful for urban management; (**b**) different levels of urban administration are not obtaining coherent sets of information satisfactorily, nor can they depend on each other for joint use of specialised information; (**c**) reworking of specialised information for generalists is done only sporadically in those urban centres where the necessary personnel are at hand; and (**d**) those governments most aware of the values of constant interchange of information have not yet found a practical way to do it, faced as they are by obstacles that only concerted action can surmount.

Costs of Urban Information

One of the main findings of the survey was the fact that many agencies questioned had no idea what were their costs for information gathering and dissemination. Many were unaware of the related parts of the information transfer process. They did not recognize that attendance at conferences and meetings, circulation and preparation of

unpublished reports and memoranda, replies to questions asked of staff, citizens and elected officials alike, are all part of the information flow of their government, and could be costed.

Not only could the elements of information handling be costed, but various methods of providing the information needed could be compared, so that the most economical method could be selected for use.

It is also evident that the time spent in searching for information and not finding it is a very large cost of most municipal governments. Decisions are often based on incomplete and partial information, and the costs of errors or inefficiency resulting from such decisions, plus the further cost to up-date and revise them when more complete information is available, should be taken into account.

Those municipalities that were beginning to understand the role of computers in information gathering and processing were better aware that costing of information handling could be beneficial, and if the most effective methods were related, there could be financial benefits.

It was difficult to determine the amounts spent by those engaged in urban government for the information they seek and use, although the survey tried to do this. Some agencies spend substantial sums, up to a quarter of their budget, on information. Different methods of calculation, based on a detailed analysis of costs in three major cities and on answers from about a third of the other municipal units interviewed (32 of the 92 units in the sample) point to a global estimate of at least $350 million a year being spent in Canada for information at the municipal level alone. In some cities, more than a third of what is spent on information goes for its internal processing. The cost of looking for and handling information can represent nearly half the salaries of high-ranking officers. These estimates vary and should be verified from a larger sample; it is clear that urban governments should know much more about this important item in their budgets.

Based on other information studies in Canada, we can say that the typical municipal employee spends from 5% to 15% of his time on his information base. Some municipal services and some provincial departments devote almost all their efforts to the organization of urban information. In 1969, the salaries of Canadian municipal employees amounted to about $1.2 billion, not including the salaries of the employees of autonomous municipal enterprises, independent boards and those units in provincial and federal governments that are responsible for urban management. We could safely double this figure to include the salaries of all personnel involved in urban management, or a payroll of $2.4 billion a year. Assuming that 15% of all their time is devoted to information, the cost to this country for urban information is now about $350 million a year.

These estimates, however raw at the present time, should be related to the problems identified. Although no-one in the municipalities concerned could supply precise figures as to the costs of the urban information used (as opposed to other municipal services, such as street lighting or police payroll), all agree that their urban information is relatively inadequate. Our conclusion is not that new and better organized urban information services would necessarily be less expensive; rather we are convinced that the considerable amounts now spent do not yield the information services required.

Municipalities have therefore to take for themselves the appropriate combination of steps for:

a. better identification of the costs of their present information services;

b. reorganization of these services to make better use of resources now available;

c. establishment of new regional and country-wide services which would increase the use of available information without increasing costs at the same rate for each individual participant.

IV. Sources of Urban Information in Canada

A. Use of Canadian Sources of Urban and Regional Information

Main Canadian Sources of Municipal Governments for Current Information

Based on interviews conducted with respondents in all parts of Canada, it is possible to identify the main sources of urban information now being used by municipal governments. In some cases the types of source to be found in each category overlap. The number of interviews did not permit a completely exhaustive enumeration of all sources that are available to Canadian users. Such an enumeration would run to many thousands of separate sources and would contain the names of hundreds of publications, organizations and individuals. What the interviews did show was the predominance of certain types of source available to municipal departments, as well as to other users of urban information in Canada. Appendix C contains a summary of current and retrospective domestic sources that were indicated by Canadian municipalities. Appendix D describes sources outside Canada that are relied upon by Canadian users.

In order to produce a reasonably manageable overall summary, responses from the interviews were tabulated according to whether the respondent either noted a source as important or valuable, or simply mentioned it. This broad classification was necessary because the number of responses was not large enough to make any finer breakdown meaningful and because of the qualitative nature of the responses. The number of interviews in each municipal service or agency noting a particular category of source as important was taken as a percentage of all the units interviewed in similar services in all municipalities or agencies. The resulting percentages were given different weights and placed in the matrix shown in Figure 4 on page 28.

Based on the interview responses from municipalities, it was possible to rate the relative importance of the various classifications of sources reported. The Table 3 (page 29) gives this information.

The number of interviews represented in Table 3 is so small that firm conclusions are hazardous. Municipal departments with the widest range of sources include planning and land use, administrative heads, roads and streets, and transport.* The limited need of such departments as permits and inspections, police, personnel and assessment is reflected in the small number of information sources they reported as necessary. The strong ties of local boards of education with their provincial education department are evident in that local boards consistently reported the Province as the most important information source.

Provincial governments also stand out as being prime sources of information to users in municipal administration. As seen by the respondents, the federal government as a whole does not appear to be an important direct information source.

Major sources reported as significant include other municipalities and associations (both trade and professional). The importance of these two sources points out the dependence of respondents on personal contacts. Sources in the immediate vicinity of respondents – including individuals, records and files in other departments in the same municipal administration – are also significant for many functions, notably administrative head, mayor, assessment and roads and streets.

As could be observed from the matrix in Figure 4, the compilation it represents yields roughly, in most cases, the same ordering as in Table 3. Provincial governments are dominant. Associations rank high along with "other municipalities". Sources within the same department (people and records) and other departments in the local municipal administration are also prominent.

1. Major Urban Information Linkages

Figure 5 (page 30) represents diagrammatically major linkages among some important groups dealing in urban information in Canada. The diagram is of necessity vastly oversimplified; it concentrates on interactions among levels of government and major private sources rather than linkages *within* government levels, in an attempt to illustrate some major strengths and weaknesses in these linkages.

* See Appendix C for detailed accounts of sources mentioned by respondents.

Figure 4. Relative Importance of Sources by Functions

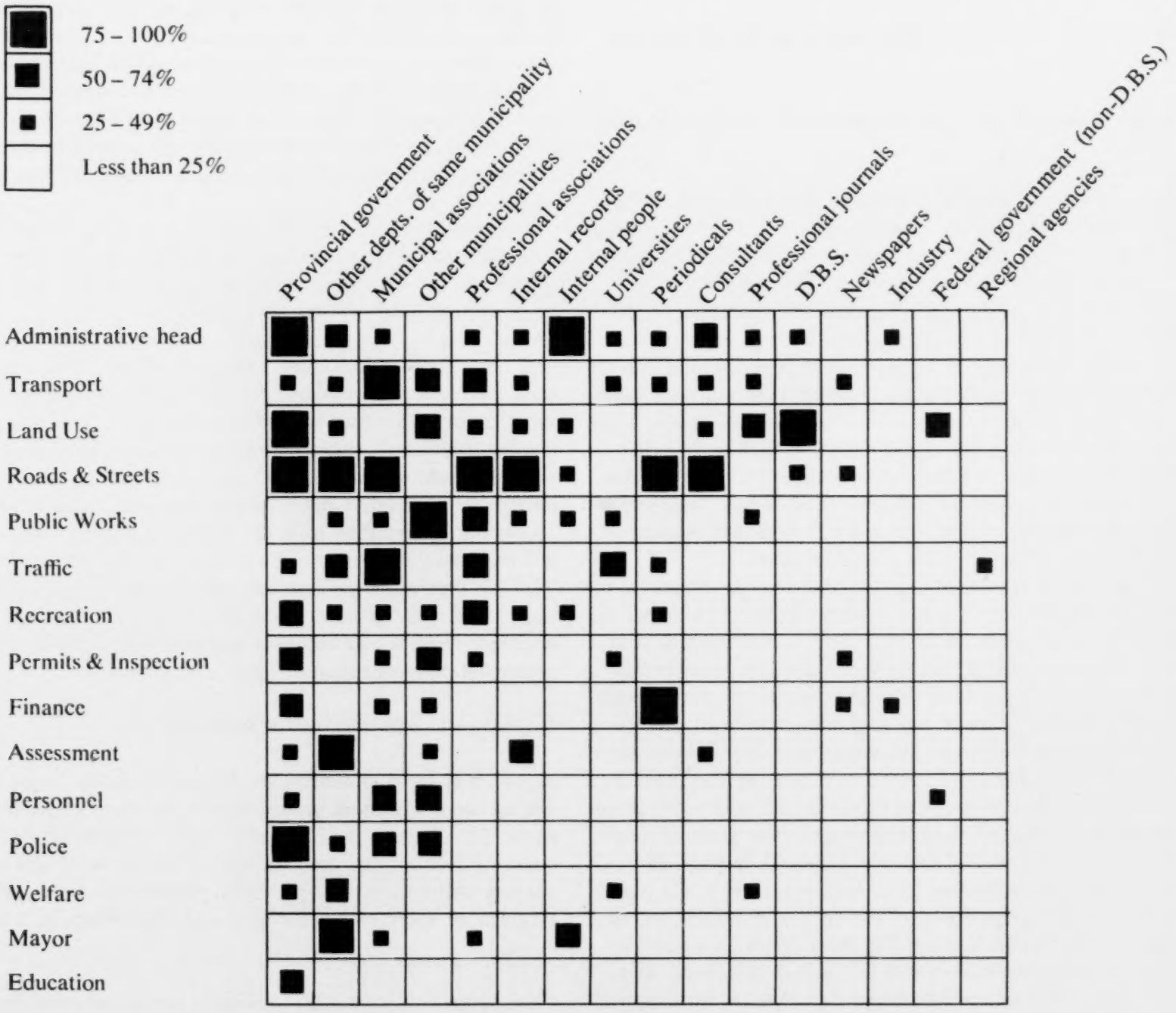


Table 3. Relative Importance of Major Sources, All Municipal Functions

Sources	*% of total interview units* reporting *specified source as* important	*% of total interview units* mentioning *specified source*
Provincial departments	57 %	75 %
Other departments of same municipality	43	61
Municipal associations	39	56
Other municipalities	36	61
Professional associations	32	51
Internal records	29	34
Internal people	23	34
Periodicals	23	59
Universities	22	40
Professional journals	21	32
Consultants	19	39
Newspapers	14	27
Federal government other than D.B.S.	12	48
Dominion Bureau of Statistics	5	34
Regional agencies	5	16
Industry	5	10

Some noteworthy points are as follows

a. municipal associations, whether provincial, country-wide or international, are generally well situated to encourage, clarify, and facilitate urban information flow and to resolve problems between municipalities and sources. The same is true of their role as exchange mechanisms among municipalities. The effectiveness of many of them, particularly the provincial associations, appears to be limited by generally inadequate resources and by duplication of functions among various associations. The important role of associations in improving urban information services would undoubtedly be enhanced by greater co-ordination, or even consolidation, of appropriate groups of associations;

b. once these associations are aligned for better intergovernmental exchanges, they can also be more helpful, in systematizing and improving the flow of information between municipalities and other bodies such as universities, consultants and industry;

c. information linkages between municipalities and their respective Provinces are of course strong and reasonably well organized along functional lines;

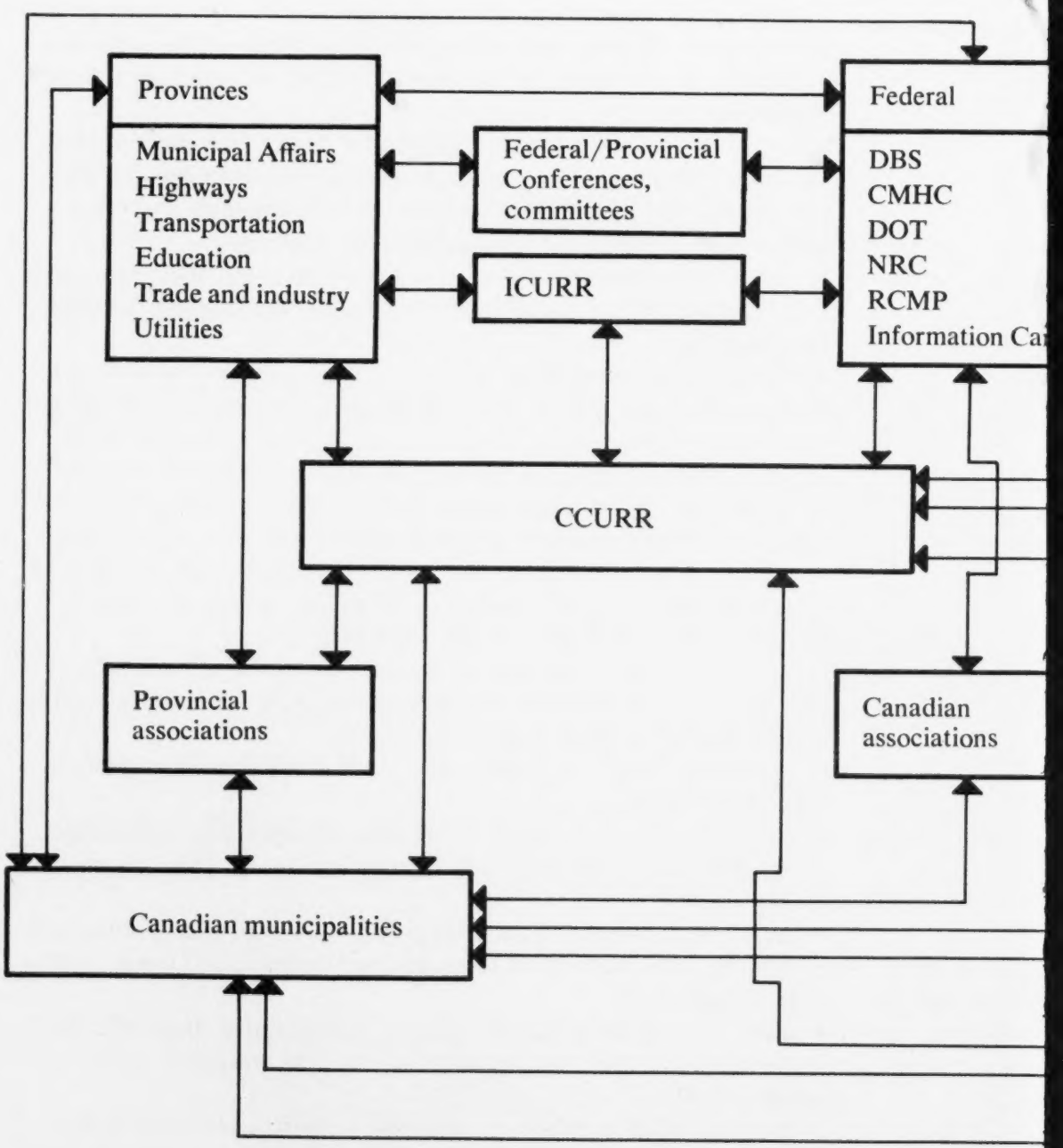
d. urban information flows among the Provinces and between the Provinces and the federal government, appear to be generally along departmental lines and, in the latter case, heavily dependent on the regional offices of some of the larger federal departments. Greater co-ordination of data exchanges relating to urban-oriented federal and provincial government programs with a large information content, by conferences or otherwise, would be an important objective of a co-operative urban information service. The role of Information Canada in this area has yet to be developed;

e. the use of local and regional agencies such as municipal reference libraries and research institutes, as centres in an improved information network is of particular importance;

f. generally, improved information services for Canadian municipalities will require:

- rationalization of the types of linkages among major sources and users, enhancing some and reducing duplication in others, as discussed above
- means of standardizing data categories and time/space co-ordinates
- drawing more fully upon resources such as those at Dominion Bureau of Statistics
- using modern information handling techniques to more effectively store, handle, retrieve and transfer information, statistical as well as nonstatistical
- means of making known to users the resources and information available from all relevant sources and how to make use of them; and

Figure 5. Major Linkages Among Some Principal Sources in Canada



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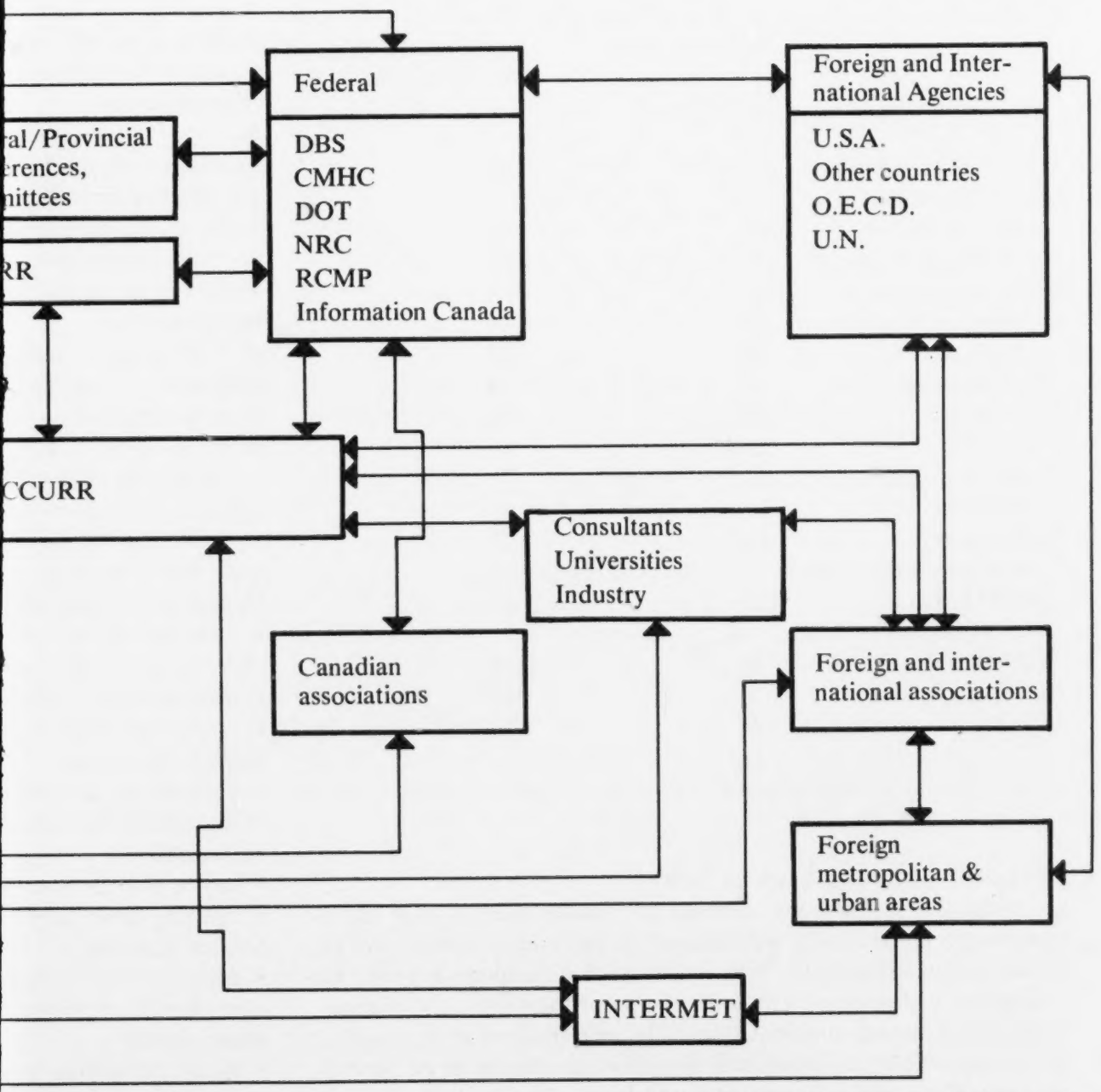
ıcipal Sources in



(Alphabetic abbreviations are identified on p. 57.)

means of establishing and strengthening personal contacts between users and sources of urban information.

Appendix C to this report brings together some of the information on Canadian sources for current awareness as well as retrospective sources. Appendix D describes international sources.

2. Major Sources of Current Urban Information

The following is a review of some of the main types of information used by urban municipalities in Canada. Not included in this review are details on the roles of universities, consultants, professional journals, newspapers, commercial and industrial firms or regional governments, all of which have a part to play in information provision.

Departments of Municipal Affairs. Each Department of Municipal Affairs plays a central role in the activities of municipalities in its Province. Some Provinces such as New Brunswick, are taking over services that were formerly carried out at the municipal level (e.g. assessment, welfare). Ontario took over assessment beginning in 1970. British Columbia plans to follow suit in a few years. The latter two Provinces are also moving ahead in developing regional governments or regional districts.

These developments, plus the fact that the Departments of Municipal Affairs usually compile useful statistics and directories on municipal matters mark them as central parts of any Canadian urban information service, both in actual exchange mechanisms and in efforts to make information comparable. Stronger "horizontal" linkages among the Departments of Municipal Affairs of the various Provinces will enhance this role.

Municipalities as Sources of Information. In large municipalities, many of the departments are important information gathering and processing services with their own departments and professional staff. They have become significant sources of information for other municipalities in the Province, in Canada, and to some extent in other countries.

Sources within the Municipal Administration. "Other municipal departments" within the same municipality are of major importance as sources of information. Co-ordination of municipal functions and well trained and alert staff, conscious of the importance of information contacts, are basic priority requirements for urban management.

Generally, more effective arrangements for intramunicipal information flow are found in the smaller municipalities and in the very large centres such as Metropolitan Toronto. They are somewhat less effective in the intermediate size group. This can be explained by the fact that personal contacts usually suffice in smaller municipalities, while in the very large ones, co-ordinating committees and related mechanisms have been and are being set up on a systematic basis. Municipalities of intermediate size, however, can no longer rely on personal contacts alone but have not yet the more systematic structure required. Better urban information services will provide more comparable information, which will help municipalities of all sizes to draw on the experience of others in improving management/information structure and effectiveness of municipal services to constituents. This will represent a most important function of such improved services.

Local Information Centres. Only in Toronto did the survey find comprehensive sources of information about the locality; these were the Bureau of Municipal Research and the Metropolitan Municipal Reference Library. The latter collects and makes available documents on all aspects of Metropolitan Toronto, while the former analyzes and reports on problems of municipal administration in all its aspects. Taken together, they offer the keys to available information on Metropolitan Toronto and its immediate region; people using their services generally regard them as extremely useful.

Few equivalent focal points were found in other Canadian municipalities. Yet, such services, if they existed in major Canadian centres, would undoubtedly play an important role in facilitating the flow of information. In addition to their local information roles they could serve as nodes in a Canadian urban information network.

Mention should also be made of the Toronto Area Research Conference, organized by the Metropolitan Toronto Board of Trade. This

organization groups at present approximately 40 agencies and firms in Metropolitan Toronto interested in urban research and planning. It includes membership of both federal and provincial government departments, as well as industries, department stores, banks and City and Borough departments and boards. Its main function is to serve as a means of exchanging information about available statistical series and urban research in progress in the Metropolitan Toronto area. The Conference membership list for 1970–71 is given in Appendix E.

Information Exchange among Municipalities. Most of the exchange of information among municipalities takes place among municipalities of similar size. Departmental staffs usually consider most relevant to their needs the experience of another municipality with approximately the same population and financial resources. Exceptions to this pattern occur when an area is thought to be too different in terms of geography, climate or some variable to be used for comparison.

In some functions, this horizontal pattern of exchange among cities is particularly notable (e.g. personnel departments for collective agreements; planning studies; public works and transit for operating information).

Municipal Associations. It is possible that the existence of a large number of associations dealing with specific aspects of municipal affairs is in fact a result of inadequate coverage by other means. The typical municipal association has in the main inadequate resources to collect, analyse and disseminate fully the information requested by its members.

Generally, the associations provide a loose structure for personal contacts through conferences and seminars supplemented by occasional bulletins. Some associations also carry out surveys but their lack of timeliness often limits their use.

In Ontario, the proliferation of associations confuses the flow of information and dissipates resources that municipalities can afford to pay for membership fees and conference delegates. The possibility of merging into a single organization is being contemplated by these associations.

In addition to provincial municipal associations, there exist a number of major Canadian associations to which municipal administrators belong, each with a separate area of responsibility, and whose interests touch upon the urban field (e.g. Canadian Political Science Association, Royal Architectural Institute of Canada). Some of the responsibilities clearly overlap. The Canadian Federation of Mayors and Municipalities has acted for many years to co-ordinate the efforts of elected municipal councils and of administrators on a country-wide basis.

Country-wide Co-ordinating Bodies. The Canadian Council on Urban and Regional Research was established in 1962 and is concerned with the conduct and use of urban and regional studies in Canada. The members of the Council come from governments, universities, the professions and the private sector. The Council provides a number of clearinghouse and information services, and issues *Urban Regional REFERENCES Urbaines & Régionales*, a classified and indexed listing of Canadian publications in the field of urban affairs.

The Intergovernmental Committee on Urban and Regional Research (ICURR) was established in 1968, consisting of officials from the Provinces and the federal government. The Committee acts to exchange information among these governments and its members are responsible for informing other officials in their own government of current inquiries elsewhere. The Committee's main activity is to circulate abstracts of current studies by member governments.

The International Association for Metropolitan Research and Development (INTERMET) was formed in 1969 following a 1967 Centennial Study and Training Program on Metropolitan Problems, sponsored by the Bureau of Municipal Research in Toronto. Member groups of this Association are from metropolitan areas with a population of over 1,000,000. The Secretariat is located in Toronto. The Association plans periodic world-wide and regional conferences and other activities, to maintain personal contacts among its members.

An important contribution to improving urban information exchange would be to encourage active co-operation among these bodies, to develop concrete information services and to reduce duplication of efforts. With this realization of their potential to become the

ocal points of information flow in their respective areas of cover-ge, these groups could then provide a basis for exchange across the ountry.

ederal Government Agencies. Because of the nature of their respon-ibilities, many federal departments and agencies play only a minor nformation role for urban users. Notable exceptions however in-lude Dominion Bureau of Statistics, which is the basic source of sta-istical data; Central Mortgage and Housing Corporation (housing ata); National Research Council (building standards) and Depart-nent of Transport (major airports, harbours, traffic).

Other bodies play an even more peripheral role, such as the De-rtment of Public Works, and the Canadian Transport Commission. he local and regional offices of federal government departments nd agencies are often involved with specific facets of municipal ad-ninistration. An example is the network of Canada Manpower Cen-es which work closely with local welfare officials.

Generally, however, there is considerable potential for the greater se of information available from federal government sources and nore extensive use of their networks of regional and local offices to acilitate the exchange of information across Canada. In particular, he facilities of the Dominion Bureau of Statistics, National Library, Central Mortgage and Housing Corporation, Department of Trans-ort, Department of Manpower and Immigration, Department of Re-ional Economic Expansion and Department of Public Works could, co-ordinated into one or more networks integrated with provincial, unicipal and other sources, result in significantly improved urban in-rmation services in Canada. Federal co-ordination should be con-idered by the new Ministry of State for Urban Affairs and Housing.

ack of Sources Oriented to Users. It is obvious from the survey re-ults that sources are numerous and varied, and it is also apparent hat this in itself constitutes a serious problem. There are too many ources providing vast arrays of general information, of which only a mall portion is specifically oriented toward urban users. Examples of is situation include:

- local newspapers and country-wide papers such as the *Financial Post* which are aimed at a general audience and have incomplete coverage of affairs of interest to municipalities
- trade magazines, typically full of irrelevant items and advertisements
- industry literature on a wide range of equipment often floods such offices as public works
- the Dominion Bureau of Statistics data, not available in many cases for geographical units and/or data categories appropriate to urban information needs
- many respondents specifically complained that there was too much irrelevant information that requires excessive sifting and anlysis before it can be useful.

The wide variety of organizations, networks and sources which exist gives further indication that urban information must be gleaned from a number of sources that only partially fill the need. Only a few publications in Canada, such as *Civic Administration*, are of country-wide scope and yet aimed at a specific municipal audience. Some are distributed mainly in a particular area (e.g. *Municipal World* in Ontario; *Cités et Villes* in Québec).

A suggested approach to improved information services is the consolidation and reorientation of existing sources to produce fewer publications, data reports and conferences with each more oriented to a specific urban problem area.

Geographical Distribution of Sources. An assessment of whether respondents in Canadian municipalities favoured and used sources of information that were close at hand or remote was made, based upon:

- the replies of respondents who reported frequent contacts with other municipalities
- evaluation by the interviewers and authors of the geographical locations of the most frequently used sources (i.e. governments, other organizations) and also the scope of coverage of publications used by the respondents.

Not unexpectedly, the survey indicated a general relationship between the size of the municipality and the geographical extent of the search for information: generally, the larger the municipality, the wider the geographical reach for sources of information.

In the series of interviews with municipalities, there were only isolated significant references to contacts with sources outside North America.

English-French Language Sources. Impressions gained in this survey of barriers to sources of information specifically attributable to differences in language are obscured by a number of factors. Two of the main ones are as follows:

- small centres tend to rely on the larger centres within their Province as sources of information. They only tend to have contacts mostly in their immediate region, regardless of the language;
- some of the persons interviewed during the survey in Québec had a previous background of working in English, which may not be typical of most municipal officials in Québec.

Little interaction was specifically noted between Québec city* and English-speaking municipalities. From the English-speaking municipalities outside of the Province of Québec, essentially no interaction with sources in Québec was noted, with the exception of some functions in Metropolitan Toronto. From the French-speaking side, the same situation was noted in most interviews: little interaction with English-speaking sources. However, it should be noted that most interview units in the Province of Québec received a number of English-language publications related to their field, to much the same extent as other units in Canada.

An additional dimension to this situation is that respondents in Québec, and indeed in other Provinces, are not aware of the available information in the other language. This lack of awareness may be the real reason for the reported lack of exchange. Certainly, when they were aware of information they needed in English, respondents in Québec did not hesitate to obtain it. Significant difficulties in this respect occurred only when a substantial amount of detailed technical material was involved. No instances were noted where information in French was used in significant amounts in the non-Québec cities in the survey. These defects are taken into account in the exchange service proposed in Chapter VI.

* Québec City was the only city in the Province of Québec in which interviews were carried out in all departments.

Retrospective Facts and Data

1. The Need for Retrospective Data

The sources previously mentioned are mainly used to the obtain info mation, to keep abreast of new developments and events. However the need for retrospective facts and data is also evident among urba information users. Retrospective urban data and facts are needed t guide current operations and future planning of municipalities. Although decisions must be based on aims and purposes established b urban government, trend analysis is used in these decisions and retro spective facts and data are essential for these analyses. An instance the municipal budget drawn up on a five-year basis as required in some Provinces.

The systematic compilation and retention of historical material is not always a prime charge on municipal authorities. As the problem of Canadian urban governments grow in complexity, and as more specialists in new disciplines of knowledge are brought into urban government, it becomes increasingly important that adequate safeguards be taken to retain the basic information from bygone years. No-one today can predict what use future generations can make of information now being derived from current operations. There is generally no easy way of accurately reconstituting needed historical data, except at great expense and labour.

Local municipal archives and noncurrent record retention program in Canada, taken as a whole, are in a chronic state of apathetic development. Clear responsibility for keeping local data archives is ofte lacking, often the task is left to some other government level, or to private auspices. Such practices make it generally difficult for users to determine the appropriate source to consult for needed historical information.

Even when materials are kept in central record agencies or archives their use is often rendered nearly impossible by the lack of proper ca

ndars, indexes and catalogues to the holdings of such centres. As in e case of training users, these are matters that are entirely within e responsibility of municipal, regional or provincial authorities to rrect.

The Dominion Bureau of Statistics is the main source of retrospec-ve statistical information for Canadian municipalities. It offers infor-ation of great importance in the fields of population characteristics, ducation, health and welfare, building and construction, transporta-n and finance.

Some federal* and provincial** departments and agencies also col-ct their own information in addition to that of the Dominion Bu-au of Statistics. Retrospective data and facts of value to present day ers can also be found in reports of Royal Commissions, from pro-ssional, trade and business associations (for instance Canadian Fe-ration of Mayors and Municipalities, Roads and Transportation ssociation of Canada), libraries (municipal, university or special), universities, and in bibliographies and other publications.

Problems of Retrospective Searching for Municipal Data

ovinces have in recent years been assuming a greater degree of su-rvision in the affairs of local authorities. This augurs well for future stematic record keeping and the building up of retrospective data. he present situation with respect to historical data is one which re-cts a pattern of gaps, inconsistencies, duplication and incompati-ity.

An exaggerated but indicative example of the problem in reconciling unicipal data for trend analysis is the situation in New Brunswick ior to 1967. Assessment policies for municipal taxes were so loose at there were "different taxes in different municipalities including ll taxes, occupancy taxes, nonresident workers' tax, and taxes on household personal property, farm-livestock and machinery, indus-trial equipment and machinery, merchants' stock and trade and the percentage of turn-overs" all accompanied by a wide range of rates, exemptions and concessions.* In 1961, cities were able to collect only 80% of taxes due while towns collected 77% and counties 64% re-flecting a certain administrative looseness.**

Assessment records present an example of municipal source data which are useful for trend anlyses, but which have not been used to their full potential. First, the records have often been kept in a man-ner which permits only current operational use, and does not facili-tate comparative searching over time. Moreover, many variables which could have been introduced to make the records multipurpose have not been incorporated. This situation is now being corrected by those large municipalities that have adopted or are in the process of adopting computerized data systems. In municipalities now automat-ing, future searches will be facilitated; but for past data there may be no gain.

Retrospective searching for quantitative data presents one set of problems. There is another in the use of noncurrent council minutes, reports and by-laws. In theory, the city clerk's holdings of these re-cords are complete. In fact, they often are not, and for many munici-palities local holdings must be supplemented by provincial holdings to have complete runs. One large city hall found that constant re-moval of pages from the records for duplication has resulted in some lost or misplaced sheets.

Council by-laws in their full historic perspective are important for consistency and efficiency in the Council's decision-making. A large Canadian municipality approached a United States' city in the 1950's for the text of a by-law, only to be told that the American city had

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Departments of Labour and Manpower and Immigration, Economic Coun-of Canada, Central Mortgage and Housing Corporation, etc.

Departments of Education, Municipal Affairs, Health, Québec Bureau of tistics, etc.

* Edward G. Byrne (Chairman). *Report of the New Brunswick Royal Commission on Finance and Municipal Taxation*. Fredericton, N.B., Queen's Printer 1963. Quoted by Ralph R. Krueger in "The Provincial-Municipal Government Revolution in New Brunswick", *Canadian Public Administration*, Vol. XIII, no. 1, Spring 1970, p. 66.

** Ibid, p. 67.

itself patterned its admired by-law on one which that very Canadian city had passed in the 1930's and was still technically in force. No case has been unearthed of any complete set of cumulatively indexed municipal by-laws in Canada. Indexes generally appear only in each bound annual volume. So vital is this gap that it is surprising to find no general complaints about it in all the literature searched. Finance first, and transportation next, are two areas that will require attention in the development of retrospective guides to available information.

B. Canadian Use of Foreign Sources of Urban and Regional Information

A widely held opinion in Canada is that we are almost entirely dependent on the United States as a source of information in running our affairs. Sample data of sources used by Canadian municipal officials reveal however a variation in the pattern of dependence on foreign sources of information, depending on the subject matter concerned. Traffic, transportation and finance agencies were examined as to data sources by country with the results in Table 4.

The range from 99% to 50% in operational dependence on Canadian sources is not commonly noted. One senior official in a provincial Department of Municipal Affairs, for example, felt that there is over-reliance on American sources of information in Canada. On the other hand, the very opposite reaction is obtained from a police force response to the effect that no foreign contacts are used by his department.

Variation in use of non-Canadian sources seems to characterise urban study researchers as well. When we examine the sources cited in 47 studies sponsored by the Canadian Council on Urban and Regional Research, the resulting distribution is shown in Table 5 (page 38).*

Figures on over-all distribution can be misleading, however, and inferences should be related to the distribution of sources used in a particular topic or discipline. The range in origin of sources by subject as determined from the same Council studies are shown in Table 6.

French sources showed up more significantly in studies of social and psychological behaviour. All the French sources were cited in studies done by French Canadians. In planning studies, where more French Canadian works were represented than in the other categories, 25% of the references were from France. French Canadian studies, in fact,

* No attempt was made to select the studies to fit into any predetermined pattern.

reflected a wider selection of reference sources than English Canadian studies, and most of the references cited from the "other countries" categories were from French Canadian studies. English Canadian studies used mainly Canadian or United States sources.

International bodies have not shown up as sources in these observations because in each of the centres selected, the proportion of such references was either zero, or less than 1%. This should not be interpreted to imply that we have no international contacts. To the contrary, it will be shown that Canada participates actively on international bodies.* The type of contact afforded at this level, however, appear to be mostly of a professional information exchange nature, and is not often quoted directly in the literature.

Table 4. Origin of Sources for Three Municipal Functions

Origin of sources	*Road traffic*	*Transportation*	*Finance*
Canadian	50 %	57 %	99 %
U.S.	50	32	1
U.K.	0	8	0
Other	0	3	0

* Appendix D of this report gives some indication of selected international and foreign sources of municipal information and data.

Table 5. Origin of Sources

Total number = 1,139

U.S.	*Canada*	*France*	*U.K.*
54 %	39 %	6 %	1 %

Other sources were less than 1% and discounted.

Table 6. Origin of Sources (Percentage Distribution by Subject of Study)

Subject of study	*U.S.*	*Canada*	*France*	*U.K.*	*Other*
Behaviour-political	20 %	80 %	0 %	0 %	0 %
Administration	26	72	0	2	0
Traffic and transportation	84	16	0	0	0
Geography (including land use)	69	22	3	5	1
Behaviour (social and psychological)	69	11	16	4	0

V. Information Transfer in Related Fields

formation Systems in Other Subject Areas

t the present time efforts are being directed in Canada in a number other fields in order to develop information systems to meet the eds of Canadian users. These efforts are being spurred on by the neral realization that managers and decision-makers in many fields not have the most effective access to domestic and foreign sources knowledge. Much of the effort is concerned with improving access Canadian sources of information and improving the analysis and ssemination of knowledge being provided from abroad.

Among various areas of information system planning which are un- r active consideration at the present time are: **(1)** scientific and hnical information; **(2)** social science data and information; **(3)** the nadian construction industry; **(4)** health and medical information; elementary, secondary, and post-secondary education; **(6)** federal, ovincial and regional government services; and **(7)** library networks ross Canada. Other areas of concern to municipal services are also ng developed, but are not described here.

Scientific and Technical Information

e Science Council of Canada in September 1969 published a re- rt prepared by a committee under the chairmanship of Dr. Leon tz. Based on this, and on various other studies, the federal govern- nt has recently adopted a policy for the dissemination of scientific l technical information, which will be relevant to the present and ure needs of Canada. The basic principle behind this policy is that y information service in science and technology in Canada should based on existing expertise, and that existing systems should be ked into a network of services operated under decentralized con- l. One form of such a network is illustrated in Figure 6 on page 40. science and technology information system is to be established hin the framework of the National Research Council in Ottawa hich will be responsible for the implementation of federal govern- nt policies and for providing a co-ordinated focus for country-wide velopment).

1967-68 in the major federal government departments concerned with science and technology there were approximately 1500 persons involved in information and library work. An estimated direct budget cost of $24 million was being expended during that year and a further $51 million was estimated as the cost of a portion of the time being spent by other federal government employees in attempting to process, use and disseminate scientific and technical information. It was estimated that in 1972-73, based on the five-year forecasts of government departments, these amounts would increase to $38 million and $61 million respectively for a total of almost $100 million. The five-year projection for staff increases alone represented an increase of 746 persons or 50% of the 1967-68 personnel.*

The more than 35,000 employees of the federal government who are classified in either the scientific, technical or professional categories form only a part of the users of federal government information services in this field. In addition, some of the effort of such departments and agencies as the National Research Council, Agriculture, Energy, Mines and Resources, Fisheries, Atomic Energy is devoted to supplying information to professionals outside the public service and to members of the public.

Most of the federal government's scientific information services are concerned with the collection and dissemination of recorded information rather than with analysis and evaluation. The largest portion of the federal budget for information is spent on accumulation, storage and distribution of printed materials.

With the creation of the new Advisory Board on Scientific and Technical Information of the National Research Council, it is expected that more attention will be given within the federal government to the provision of effective services in scientific and technical information and to the updating and streamlining of federal activities in this field.

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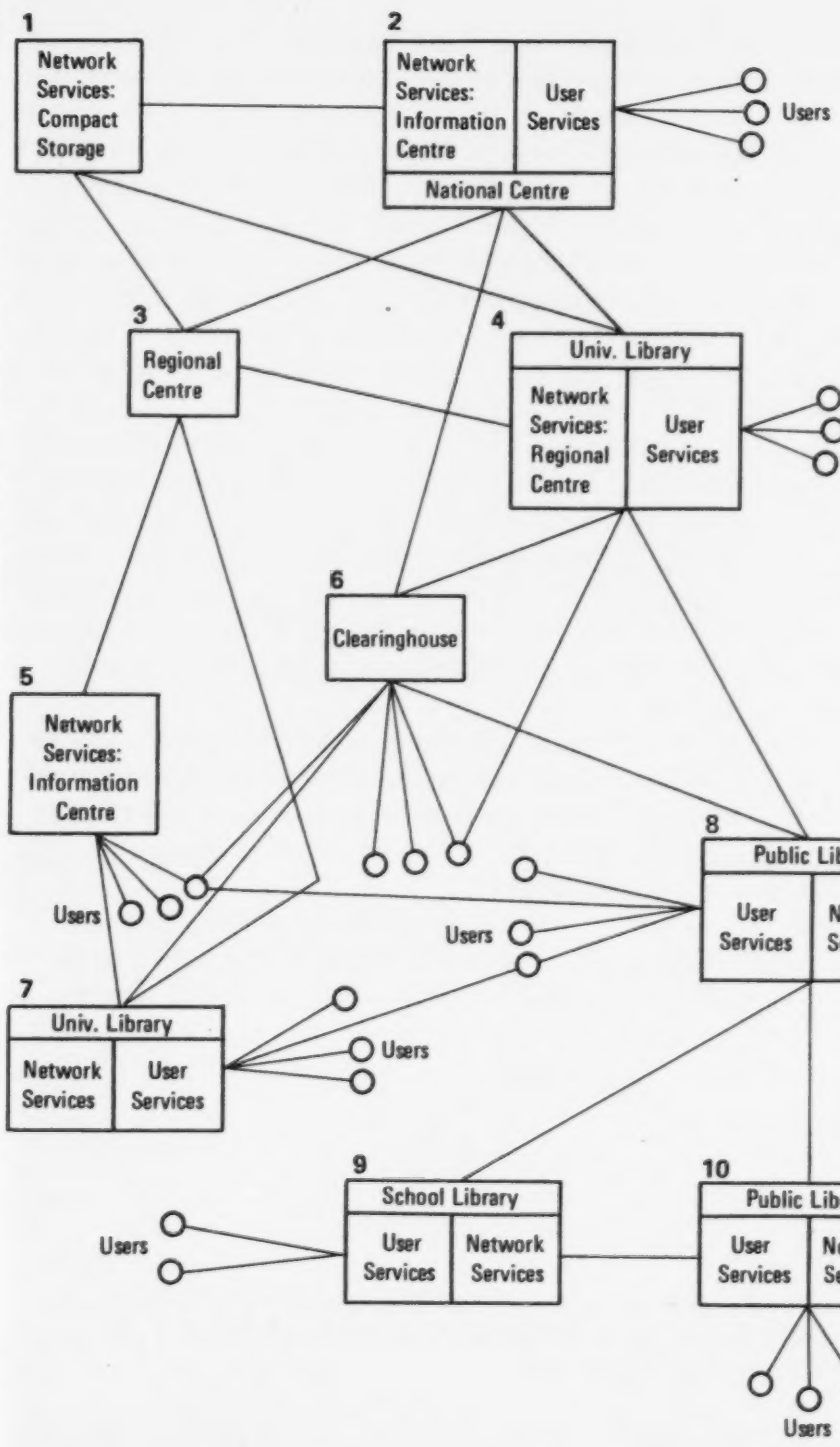
* Science Council of Canada. *Science and Technical Information in Canada. Special Study No. 8*, Part II, Chapter 1, "Government departments and agencies", and Chapter 7, "Economics".

Figure 6. National Scientific and Technical Information Network



2. Social Science Data and Information

Under the auspices of the Association of Universities and Colleges of Canada and the Social Science Research Council of Canada, plans have been adopted for the establishment of a Research Information Centre for the Social Sciences. It has been proposed that this Centre be located initially in Ottawa and operated by a Council appointed jointly by the above two sponsoring agencies. The Centre is to have the following main functions:

a. to operate as a clearinghouse of information, from universities and public and private research agencies, in order to answer the specific requests of researchers and to offer data-locating services to researchers;

b. to provide a system for the up-to-date listing of selected, primarily Canadian sources of machine-readable information relevant to the social sciences, including a description of the information and the mode of access to it;

c. to aid, through technical assistance, the foundation and development of data bases, and to promote the development of an information exchange system.

In addition to the initiative of the Universities and the Social Science Research Council indicated above, a number of research centres in Canada dealing with mass-media and communication research have studied the possibility of establishing a country-wide clearinghouse and information service. A further important area in social science concerns legal and juridical data and information. A project for a machine-readable information and data bank in this field by the Université de Montréal is being carried out with the support of the Department of Education of Québec, the federal Department of Justice and the Canada Council.

Figure 6
Source: *Scientific and Technical Information in Canada*, Part II, Chapter 6, "Libraries", *Special Study No. 8*, prepared for The Science Council of Canada (p. 23). Reproduced with permission of Information Canada.

An Information System for the Canadian Construction Industry

survey undertaken in 1967 on behalf of the federal Department of dustry shows that the Canadian construction industry maintains a rge and costly information apparatus of uncertain quality and effi- ency. Some of the highlights of the situation then revealed were:

twenty to thirty million pages of product literature in the con- ruction field are disseminated annually, an amount increasing at % per year. Sixty-five per cent of this is discarded by users either on ceipt or after first reading;

four hundred million pages of literature on products and build- g technology are stored on users' premises throughout Canada;

some 20% of the data is more than three years old, 35% is from ne to three years. Eighty thousand queries per day flow from users all information sources in Canada and abroad;

production, dissemination, storage and retrieval of information costing the Canadian construction industry in excess of $300 mil- on per year, approximately 3% of the total annual value of all con- ruction work.

General performance criteria for the development and establishment f a construction information system are being developed by the De- artment of Industry. A pilot project for an operational information ervice has been initiated and is at present being tested in various arts of Canada.

It is evident that the development of such a construction information ervice will aid the work of municipalities in Canada provided that ocal governments have access to it and that it is devised to include heir needs.

4. Information Services in the Health Sciences

With the increasing development of federal and provincial govern- ment medical and health services, more attention is being paid to the rganization of medical information systems required on a country- vide and regional basis. The Medical Research Council of Canada nd others have provided an outline of the way in which medical records may be linked across Canada in the health field, which includes genetics, epidemiology and vital statistics. Efforts are being made by individual hospitals, regional boards, provincial governments and the federal government to examine the way in which use of computers may be applied to the planning, administration and delivery of various health services. These range from studies in automated stock-keeping in the pharmacy to the diagnosis of clinical problems and the exchange of medical data from all parts of Canada.

The Medical Research Council in 1968 recommended model legislation for the establishment of health and medical data information services for Canada. Because of the importance attached to the safeguarding of privacy in the field of medical and health information services, the federal Department of Communications is studying the creation of a planning and co-ordinating agency in order that Canadian health information services may fit into an integrated multipurpose information network.

5. Elementary, Secondary and Post-secondary Education

The process of both formal and informal education is essentially concerned with the transfer of information. A large proportion of the nearly $7 billion now being spent annually on education in Canada is used for this purpose. However, due to the fragmented state in which education is financed and the separation between elementary, secondary and post-secondary education, little has been achieved in the way of co-ordinated country-wide or regional information systems to meet the needs of students, teachers or administrators.

A number of projects aimed at initiating such a system for Canadian users have recently been discussed in Ontario, under the auspices of the Ontario Institute for Studies in Education. One of the basic problems of educational information systems is the need to combine the traditional information systems now in use with the newer and largely machine-based information systems developed by government and industry. A number of pilot projects centred in the larger municipalities, including one in Winnipeg, are being undertaken or considered. The results of these networks in education will have a

bearing on the whole design of current and retrospective municipal information systems.

The Ministers of Education of all the Provinces have requested that the Dominion Bureau of Statistics act as a co-ordinator and developer of an information system in collaboration with the individual Departments of Education. The aim of an integrated system of educational information on which the efforts of Statistics Canada are being concentrated, is to bring together the data on students, staff, facilities and finance in such a way that inter-relationships can be studied within the framework of compatible classifications. The results of such studies will provide comprehensive and detailed information which is required for educational planning within a Province and among Provinces.*

6. Federal, Provincial and Regional Government Services

In addition to the above areas now receiving attention in Canada, efforts are also being made by the federal government, various Provinces and some Canadian municipalities and regions to improve and rationalize their own data and information services. A federal government Task Force on Information provided a number of recommendations in 1969 which culminated with the formation of Information Canada, a new federal government service to co-ordinate and supervise the assembly and distribution of information on behalf of the federal government.

Information Canada quite recently took over the distribution function of the federal Queen's Printer; the new agency proposes, in cooperation with other agencies, to establish local and regional information centres to which citizens may make direct inquiries. Such centres will be linked to various services of the federal government and information referrals will be made on behalf of the inquirer to these services.

The Provinces of Québec and Ontario have recently reorganized their publishing, information and broadcasting policies with a view to securing a more effective dissemination both within each Province and beyond. Certain of the larger municipalities, notably Metropolitan Toronto and Metropolitan Montréal, have also established information services both for internal and external use.

7. Library Networks across Canada

An important group of agencies dealing with information are the various Canadian libraries: special, academic, public and government. Together they constitute a reservoir of a large part of the printed and published knowledge available in Canada.

Most libraries have a local conception of their users' needs. They are essentially concerned with those persons who are their immediate local clients. They also have various subject interests, and tend to be concerned with a particular area of knowledge or group of users specialising in one subject. Even the large public and academic libraries are made up of collections of subject materials which, while classified within a comprehensive scheme, in fact vary in depth of coverage from one subject to another.

It is thus essential that the ability to transfer information from one library to another be speeded up through interlending, photocopying and other devices. Much effort is now being spent by Canadian library management in attempting to establish various regional and country-wide networks of library resources. In this, the roles of the National Library and the National Science Library in Ottawa are of prime importance.

The development of library networks in Canada requires agreements and financing on a country-wide and provincial basis. It also requires a more sophisticated communication network.

Member libraries in a Canadian network will have to some degree a dual function in user services. They will give service directly to local users on the one hand, and they will provide services on request to other members of the network. For some purposes the network will also require central storage or clearinghouse services; these will be organized solely to serve the member libraries in the network and will have no local users. Figure 6 (page 40) illustrates this type of network.

* "Some recent Developments in the Dominion Bureau of Statistics", prepared for the Canadian Economics Association 4th Annual Meeting, Session on D.B.S., Wednesday, 3 June, 1970, p. 71.

VI. A Canadian Urban Information Exchange Service

The Canadian Urban Information Exchange Service outlined in these pages would form, together with its various components, a subnetwork of the Canadian Scientific and Technical Information Network described by the authors of the Science Council's *Special Study Number 8* and illustrated in Figure 6 (page 40). Its structure would be similar, and its complexity almost as great, at least as far as the number of required components is concerned.

The Elements of the Service

We might denote the nature of a Canadian Urban Information Exchange Service by using three organizational concepts: **(1)** the concept of co-operation among separate urban information producing and using bodies; **(2)** the concept of an information network that would link the various agencies or bodies; and **(3)** the concept of a bilingual urban information exchange clearinghouse, that would act as a central point in the network.

1. Co-operation in the Field of Urban Information

The exchange of information depends on the voluntary participation of individual users and producers at the level of the urban area, the urban region, the Province, or of the whole country. A number of co-operating groups of users and producers have been identified in Canada. The Canadian Council on Urban and Regional Research is an example of a nongovernmental body consisting of people interested in urban affairs and knowledgeable of urban matters, which carries out referral services so far as its means permit. There are a great many other such nongovernmental groups (see Chapter IV). The Canadian Federation of Mayors and Municipalities and municipal associations in the Provinces provide examples of successful co-operation in sharing information among the administrative heads of municipalities. At the regional level, the Toronto Area Research Conference represents one model of regional co-operation for information exchange (see Appendix E). Although much more demanding from the point of view of the users, in terms of involvement, permanent support and co-operation, this type of organization has demonstrated that it is a very acceptable way of organizing co-operation in exchange of urban information in a metropolitan area.

A market-oriented commercial type of enterprise provides another means of bringing about an identification of needs and meeting it. While such enterprises may not be adequate to take on the entire responsibility for information dissemination, they could certainly take on some of the tasks.

The matter of securing co-operation among governmental bodies as well as with nongovernmental ones is exceedingly important. It is not possible to rely on one level of government alone to assume responsibility for information exchange; this could result in a lack of sensitivity to the needs of the consumers at other government levels or among nongovernmental enterprises and groups involved in urban affairs. Our survey results were quite conclusive on this question.

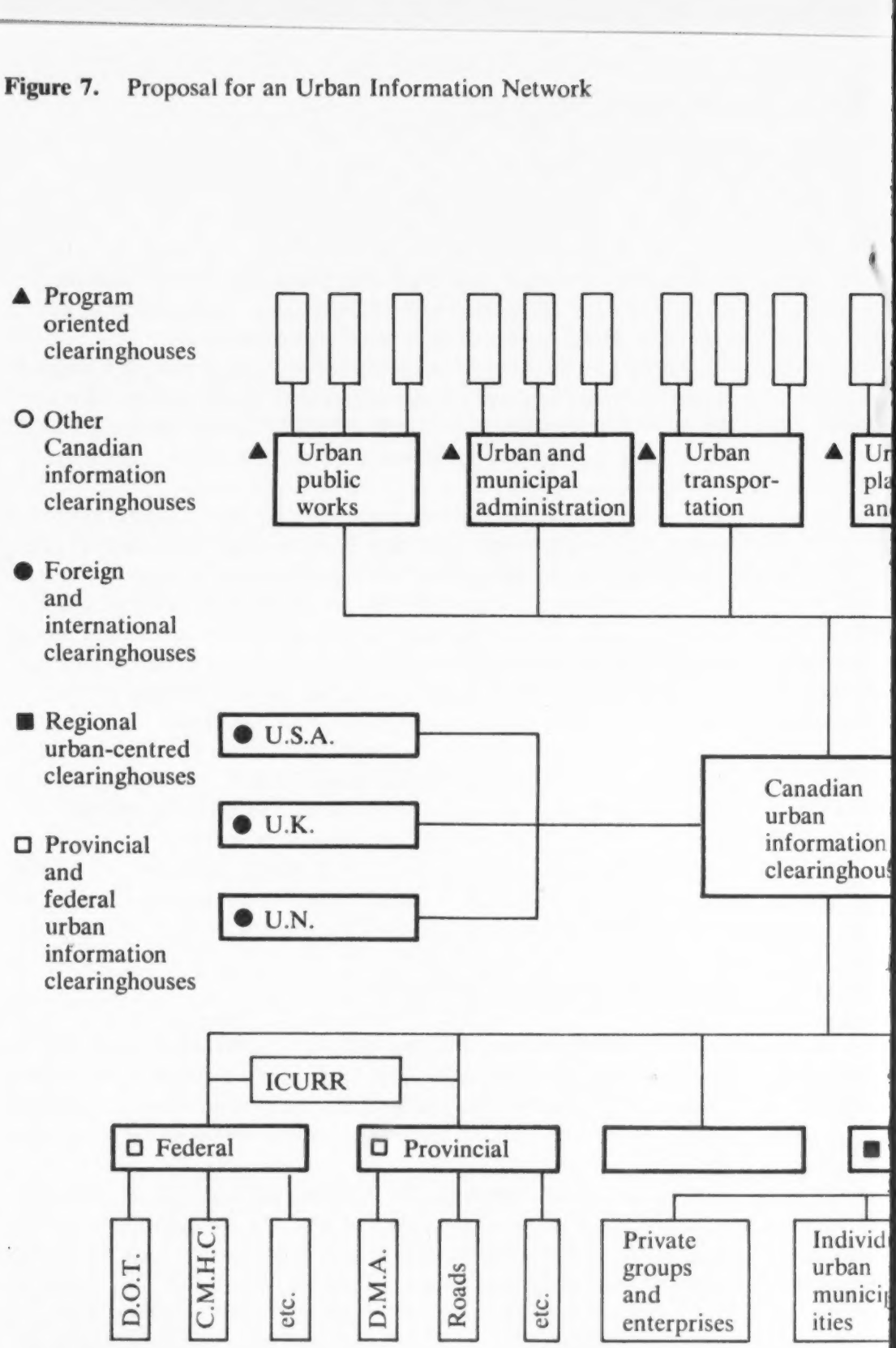
Because a high degree of importance must be placed on the role of co-operation in information exchange, the Urban Information Exchange Service should not become simply a vast "warehouse" of documents and data usable only by a limited clientele. We require a means of linking users on grounds other than market laws and immediate returns or on the basis of affinities and arrangements within each level of government. A model based on co-operation among various kinds of services and agencies is indicated.

2. Urban Information Networks

Figure 7 (proposal for an Urban Information Network, page 44) applies concepts put forward by *Special Study Number 8* of the Science Council of Canada in 1969 and adapts them to the flow of urban information in this country, using in particular the problem areas identified in Chapter III.

The group of services entitled "Program-Oriented Clearinghouses" corresponds to the need for coherent sets of knowledge; this need is particularly acute in the fields of urban and municipal administration, urban public works, planning and land use, and urban transportation. These specialised functional clearinghouses must serve the entire country, and their geographical location is not a critical element of

Figure 7. Proposal for an Urban Information Network



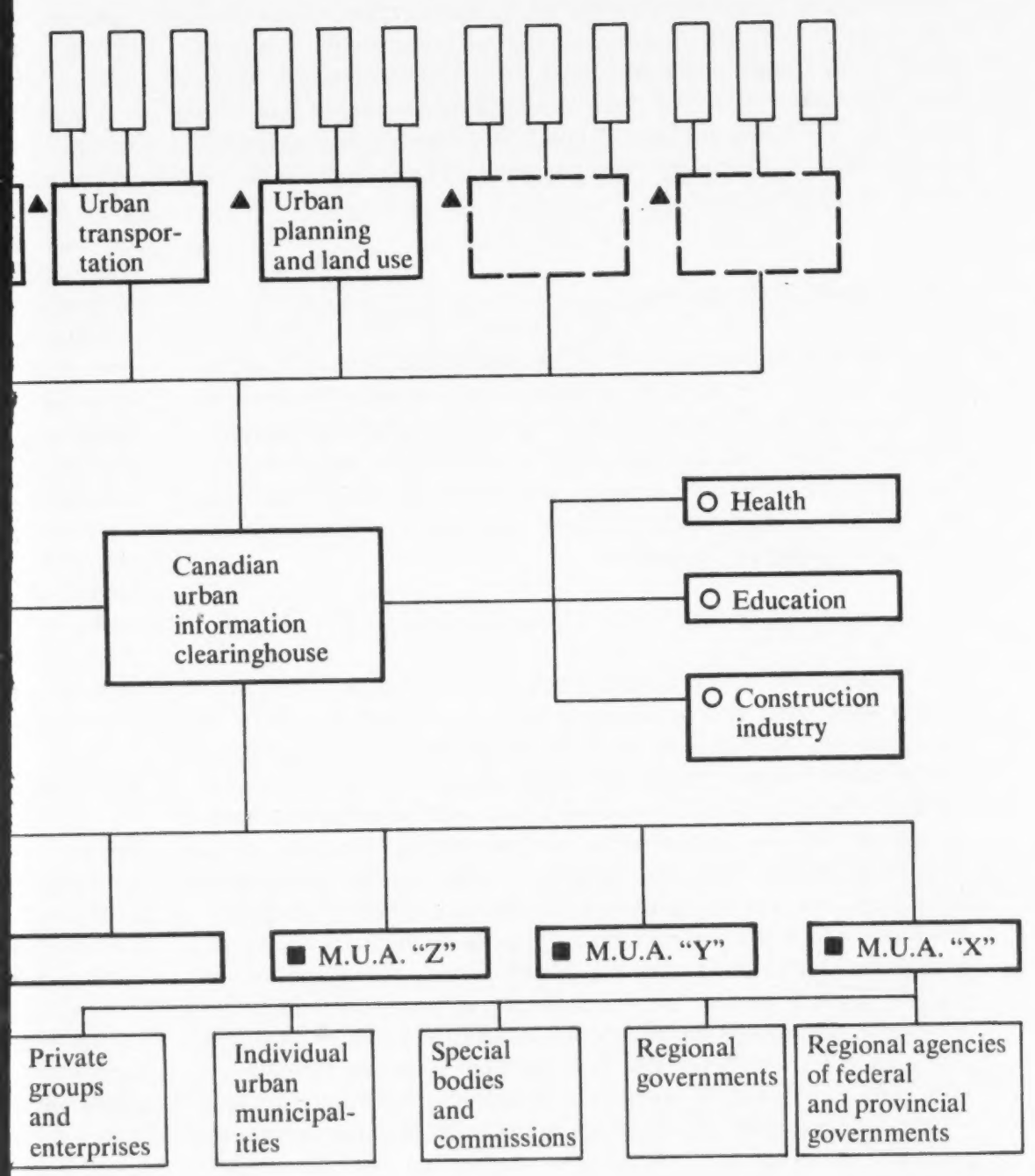
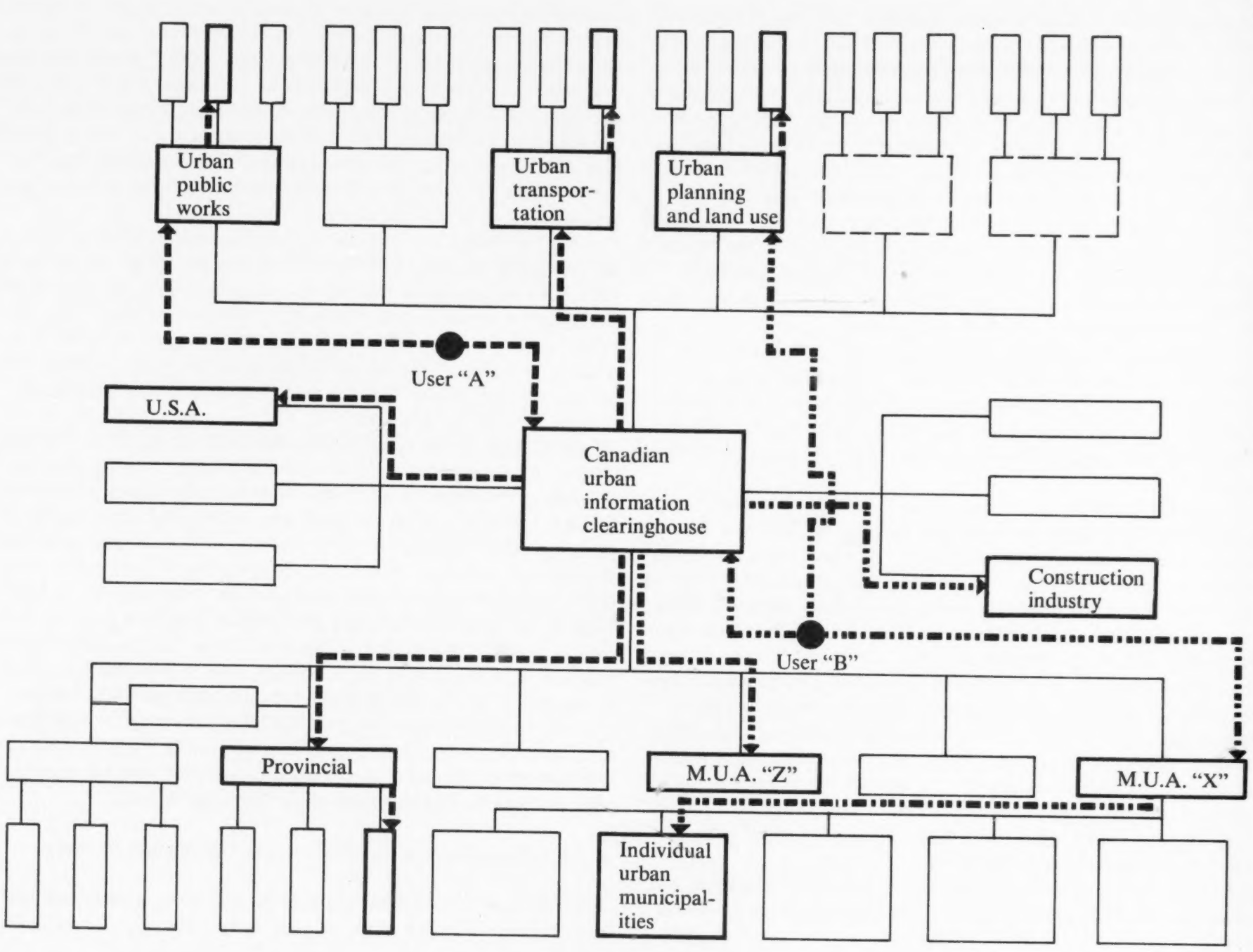

Urban transportation
Urban planning and land use
Canadian urban information clearinghouse
Health
Education
Construction industry
M.U.A. "Z"
M.U.A. "Y"
M.U.A. "X"
Private groups and enterprises
Individual urban municipalities
Special bodies and commissions
Regional governments
Regional agencies of federal and provincial governments

Figure 8. Typical Uses of the Urban Information Network



their operation. What is important is that they make use of centres of excellence in their respective fields, serve everyone requesting their services, in both English and French, and be assured of mutual co-operation and support of related services. Establishment of specialised clearinghouses will no doubt be the result of co-operation between those users whose work requires co-ordinated sets of knowledge identified on one hand, and professional and technical associations on the other. Some of the latter are already trying, with the means at their disposal, to answer the needs of their members: gathering, analyzing and diffusing their analyses and affording the means of access to sources of relevant information. Table 7 (page 47) lists the roles and responsibilities that these Program-Oriented Clearinghouses may assume and their relation to other clearinghouses.

The "Regional Urban-Centered Clearinghouses" group and the "Provincial and Federal Urban Information Clearinghouses" correspond to the need for regional pooling and exchanges of information and data that has been clearly emphasized in the survey, and to the needs for exchange of knowledge and information among governments.

A Regional Clearinghouse would tap formally the urban information resources of a region in somewhat the way the Toronto Area Research Conference now does informally. It could reach out to municipal and school administrations of the urban area itself as well as in the larger urbanized region. It would also include administrations of the smaller urbanized satellite areas located away from the urban area; public and nongovernmental regional administrations; regional decentralized elements of federal and provincial governments (Manpower offices, etc.) and private groups interested in urban affairs. Those might range from the Boards of Trade to citizens' committees, as well as labour or employers groups, or private enterprises responsible for various urban services (e.g. telephone, etc.). Each urban region could find the opportunity to work out its own original structure, always with an eye to making the most complete range of urban information available to each participant.

The problem of confidentiality of the information belonging to each participant will often present itself at municipal and regional levels and in the most critical way; it will be necessary to arrive at some balanced arrangement, in order not only to avoid the drying up of sources but also to respect the right to information of governments and individuals, as well as rights to privacy. Table 7 shows that the information clearinghouses facilitate the exchange of urban information (standardization of definitions, of gathering, of processing, of classification, localization and content analysis, etc.) over a geographic area, much as the Program-oriented Clearinghouses facilitate the exchange of technical and professional knowledge within a specialised area of urban knowledge.

As for *Provincial and Federal Urban Information Clearinghouses* the Intergovernmental Committee on Urban and Regional Research (ICURR) already plays this role to a degree among federal and provincial government bodies. It would certainly be helpful if in each Province the Department of Municipal Affairs were to favour the creation of adequate machinery for urban information exchange within the Province, with ICURR a more vigorous instrument for exchanges beyond the Province.

Even with the fullest co-operation, this whole series of area clearinghouses and information centres would be unable to bring about by themselves the objective of "better knowledge for better government" which we have set out as the goal. The importance of intraregional exchanges has already been shown, as well as the importance of interdisciplinary exchanges. But also, it is necessary to insure that these two types of information (knowledge of the urban milieu and knowledge of the technical resources and possible solutions) can combine. This is why it is urgent that a Canadian Urban Information Clearinghouse be established that has a country-wide responsibility in order to ensure the integration of various services in a complete network. It is our recommendation that such a bilingual centre be established to assume the roles and responsibilities given it in Table 7. This entire network of formal and informal co-operating services constitute what we call the Urban Information Exchange Service.

3. The Function of a Clearinghouse in Information Exchange

In the field of information, the concept of "clearinghouse" differs from the more familiar kinds of collections – libraries, "data banks"

Table 7. Functions of Clearinghouses in Information Exchange

	Canadian urban information clearinghouse	*Regional-urban-centred clearinghouses*	*Program oriented urban information exchanges*
Terminology	Minimum standards and translation capability	Regional (intermunicipal and intra-municipal) standardized definitions	Specific terminology (land use, transportation, etc.)
Specific facts	Indexing and location S.D.I.[a] "Switching" between participants	Collection and storage of data: Properties, Structures, Population Finances, Personnel	Collection and storage: Equipment and tools Costs, Materials
Standards of operation	Data Formats, Equipment compatibility, Retrieval parameters Time/space co-ordinates	Regional and local aspects	Specialized aspects
Trends	Aggregation of data and facts Time series, Indexing and location S.D.I., "Switching"	Regional and local aspects	Specialized aspects
Classifications and categories	Minimum standards of indexing, etc., General organization of urban "knowledge"	Regional and local standardization and compatibility	Specific program-oriented "field of knowledge"
Criteria	Indexing and location "People" location S.D.I., "Switching"	Minimum criteria for by-laws, hiring procedures, finances, etc.	Collect, store, index, abstract, compare, analyze, synthesize: Criteria; Standards; Policies; Procedures; Processes; Methods; Theories In specific fields: Public works; Personnel; Finance; Urban planning; Urban transportation; etc.
Methodologies	Indexing and location "People and R & D in progress" S.D.I., "Switching"	Local and regional methods and documentation on them	
Principles	Indexing and location "People and R & D in progress" S.D.I., "Switching"	Local and regional "policy" statements and documents	
Theories	Indexing and location "People and R & D in progress" S.D.I., "Switching"		Indexing and location S.D.I., "People" location

a. S.D.I. Selective Dissemination of Information

or files and records – which are centralized information deposits and have as their main function the responsibility to stock material elements of information, in particular printed or machine-readable documents. The clearinghouses which we are describing have more to do with classification, analysis and transfer of information, that is, with tasks aimed at *facilitating* the exchange and transfer of information between its producers and users. This type of clearinghouse is not addressed to the direct transmission of information, but to organizing information exchanges through a network, and transmitting references to material which may contain the information sought. Its job is efficient traffic flow among others, rather than delivery from its own hands.

The Canadian Council on Urban and Regional Research has already provided some leadership in this direction and its automated, computer accessible list of published documents on urban and regional affairs in Canada can be considered as a first step toward an Urban Information Clearinghouse service. Not only can REFERENCES be published from this list, but also specific bibliographies can be drawn up quickly on demand. Only a few hundred (around 2%) of the thousands of documents listed and analyzed by the Council are in its possession. Therefore, without being the warehouse of this information, the Council can help users obtain it on demand according to their own specifications.

Those who are familiar with current concepts of "system design" will immediately realize that we are not proposing a "system" in the sense of a complex organization of physical and material components of a clearly identifiable whole aimed at a precise mission and with clearly identified and verifiable purposes. Before such a "system" can be designed and set up to everyone's satisfaction, with adequate technology, as an instrument for maximum use in our exchange of urban knowledge, we believe many other steps need to be taken. We believe the first steps to be taken must be in the direction of an Urban Information Exchange Service whose operation would be immediately useful and which would provide immediate assistance. This Exchange Service could be set up quickly by eliminating the most obvious difficulties in present arrangements for exchanges between individuals and between institutions, which now impede the efficient circulation of urban information. These steps will require a concerted effort to plan the network, and later on, the system; some responsible agency must be designated in order to be in a position to do this, at the level of each urban region, in each area of pertinent specialized knowledge and at country-wide level.

4. Network Operation

Returning to Figures 7 and 8 (pp. 44–45), we shall illustrate here the possible operation of the network for a user.

User A, a municipal engineer, must present recommendations on a problem. These call for information which he does not have. The problem has to do with both urban transportation and public works. As he himself is specialized in urban public works, he can put his request directly to an Urban Public Works Information Clearinghouse, confident that his questions will in large part be answered. This Clearinghouse will then direct him, for instance, to the documentation centre of a department of municipal engineering at an engineering school at the other end of the country, which belongs to the network through the Clearinghouse, and they will answer his request directly. Meanwhile, the user will send his request relating to urban transportation directly to the Canadian clearinghouse which will quickly indicate to him: (**a**) a specialized source which is part of the network through the Urban Transportation Clearinghouse; (**b**) the name and phone number of an engineer in a department of a neighbouring Province, where research has just been done on the very same problem, but is not yet published; and (**c**) the addresses of some foreign sources known to the Canadian clearinghouse through the affiliation of the Canadian network to one or more foreign networks of urban information.

Once these details are in his hands, the user may obtain the information itself through the use of long distance telephone, correspondence, Telex, photocopy, teletransmission by cable or satellite, or any other means he finds appropriate. He will also know what information from which clearinghouse is confidential, in what format and in what language the information is available.

Similarly, User B may ask directly his Regional Clearinghouse for

information on the content, available data and means of access to a neighbouring town's data bank. He will go through the Canadian Clearinghouse to find out which other Regional Clearinghouse could give him comparable data; the Canadian Clearinghouse may direct him to another network altogether (for instance one on the construction industry, if his question had to do with the problems imposed by new construction methods).

5. Conclusion

The development of urban information networks in Canada is taking place at the regional, provincial, and country-wide level. The function of such networks is to provide for interchange between the partners in the network. It is not simply to facilitate a one-way traffic but to permit producers of information, to interact and exchange data and experiences in a rapid and effective manner.

It is clear that these information networks would be more effective if based on regional, provincial or Canadian agencies set up to develop such networks. These agencies might be municipal governments, municipal or professional associations, regional groups of subject specialists, etc., but in every case they should utilize expert help in the design of information networks.

The one essential requirement for developing improved information networks in Canada is a clear statement of goals and objectives on the part of those responsible for such systems. Many municipal governments, local universities, private publishing firms, provincial and federal departments, are setting out to disseminate urban information to Canadian users without first announcing clearly their goals and objectives. This is particularly noticeable in the large number of regional government schemes which are being established in various Provinces without prior planning as to the way in which information will be pooled and exchanged within the region.

Because early attention should be given to the development of urban information exchange networks in Canada, the following criteria are recommended for consideration in the construction of such networks:

a. they should be evolutionary in concept and responsive to changing needs;

b. they should be based on existing institutions and services but should also be designed to develop new institutional responsibilities where necessary. In many cases, existing institutions in Canada are not able or interested in taking an active role in network arrangements;

c. clearinghouses should be capable of interrogation and response in either English or French;

d. networks should have the ability to interact with related information systems both within Canada and abroad;

e. in order to facilitate both the creation and the management of such urban information networks, a central agency should be established with this responsibility. It would have the basic function of stimulating and developing information co-operation between the variety of agencies and services which have been reported on in this study.

6. Some Examples from Other Countries

At the present time extensive efforts are being directed in other countries towards the creation of networks and services for the collection, processing and utilization of urban information and data, both current and retrospective.

In Denmark, municipalities may become members of one of six regional centres, as well as have the benefit of technical aid from the Danish government's Central Data Processing Centre. Plans are also under way for the establishment of a Municipal Data Processing Council, which will decide on the organization of various nationwide applications of new machine technology. In other countries, such services are offered by local government associations. The Swedish Town Federation has started a service in the field of data processing for its members. In the U.S. co-operative arrangements are being practised in three broad areas: (**a**) among cities, or between cities and school districts, or between cities and counties; **(b)** between the local and the state levels of governments; and (**c**) between the federal govern-

ment and the state governments with specific information made available to local governments.

In Japan, municipalities use facilities of private computer centres, although there is a trend toward the joint use of computers by several government authorities. In Israel, a computer company has been set up which is financed 40% by the national government and 60% by local governments. It will eventually provide services to all of the 187 municipalities in the country.

Many successful information networks, particularly those making use of central computer services, have been set up to meet the needs of local municipalities on a regional, or national basis. It has been demonstrated that it is technically sound and economically feasible for a group of independent local governments to establish such services for multi-application use.* The operational files of a city or a region will, if structured correctly, provide a base for an information system that will be responsive to the needs of administrators and provide information needed for regional planning.** Additional information on those can be found in Appendix G.

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* *Metropolitan Fund Inc. Regional Co-operative Computer Plan*, Detroit, Michigan, February 1970, p. 4 (described in Appendix G).

** Barrat, J. C. *Structuring regional data*. Seventh annual conference of the Urban and Regional Information Systems Association, September 1969, Center for Urban Regionalism, Kent State University, Kent, Ohio, 1969.

VII. Findings and Recommendations

Information Needs of a Growing Urban Canada

Canada's urban population has grown forty times between 1861 and 1961, while at the same time the total population has increased only seven fold. This urban growth coincided with great changes in the functions and purposes of Canadian local governments. Each Province has been affected, but each in very different ways.

The Economic Council of Canada has indicated that the concentration of population in the largest urban centres is likely to continue. The shift to large urban centres is as pronounced in Québec as elsewhere and there is a corresponding increase in the use of French as the language of urban management in Canada.

The growth in the absolute numbers of municipal staff members will increase, and so also will the growth in the complexity of their functions. Many of the activities of urban government require coherent and specific sets of information gathered for the purpose of furthering implementation of programs specific to urban areas.

Information specific to a discipline or profession, available to certain specialized agents of urban and regional management through the information networks of their own professions, must often be restructured to be useful for urban management.

A continual exchange of information among governments about the urban environment and its management is required at the highest levels of urban government.

Uses of Urban Information

In this study of the uses of urban information in Canada, respondents have described many successes and failures; virtually all of them fall within the few categories now summarized. Foremost among the problems encountered is the significant time wasted by having to consult an excessively wide and heterogeneous range of sources; this is especially the case in the areas of general and fiscal management and to a lesser, but still significant extent, in the functions of property management and community planning. A frequent complaint was that to canvass even a selection of possible sources took unwarranted time for the amount of information unearthed. Furthermore, urban information users encounter serious difficulties locating comparable information about different places or times, a basic and continuing need of those trying to discover trends in urban affairs.

The skills needed to derive comparable information from a variety of sources for Canadian use include skill in both English and French. With present resources for information handling, want of ability in one or the other language makes for neglect of useful data, ideas and experience. While a good deal of attention has been given by the federal government and by some Provinces to this matter, less attention has been paid to it by local administrations outside the Province of Québec.

Lack of awareness of the costs of present inefficiency is a further obstacle to the effective and efficient use of existing urban information. There has been little objective measurement of cost of urban information at any level of government, so administrative authorities are unable to budget for improvement in information handling and cannot make adequate cost/benefit justification for it. Municipalities underfinance their information handling equipment and services on both capital and current accounts. Only a few municipalities in Canada are seriously studying the implications of machine-readable data systems such as are now in operation at other levels of government and in private enterprises comparable in scale with a middle sized city.

It was not possible within the limits of this survey to discover precisely how much each municipality in Canada is spending in information gathering, processing and dissemination. It is possible to conclude that approximately one-seventh of the whole local budget (other than education costs) is being spent in attempts to get and handle information: this is a realistic and supportable estimate.

Many municipalities are not however spending all of this amount effectively. Much of the amount spent is in staff salaries. The amount for contractual services, equipment, publications, etc. is probably less than one-fifth of the total information expenditure.

Sources of Urban Information

The survey of the information requirements of municipal departments shows that they have important links with their corresponding provincial government departments. It was also established that there are very close information links among the various departments in the same municipality. It is therefore a principal recommendation of this report that more effective identification of the information sources available within both provincial and municipal agencies be undertaken. For example, guide books, directories, handbooks and other information aids should be prepared in order to assist both employees and the public in locating sources of information. Not enough attention is being paid by provincial governments to their key role as primary information sources for municipalities.

1. Files and Staff Experience

Fundamental and important sources of urban information lie in the files and in the personal experience of staff members. But these resources are often inaccessible or ill-organized. More care should be taken by municipal administrations to make sure that such files are indexed, classified, catalogued and made generally available. Much useful information is locked up in one office when knowledge of it would be of value in another. Similarly, many individuals working in municipal governments in Canada have a wide range of knowledge and expertise which is not put to use beyond their own tasks. Municipal administrations should ensure that such individuals have opportunity to pool and share their experience with staff members in other departments of the same municipal administration.

2. Importance of Comparisons among Municipalities

Important sources of information to those concerned with urban affairs in one municipality are often to be found in other municipalities, whether near at hand or further afield. Much remains to be done in order to establish useful and dependable information links among municipalities within their own region and among the regions across Canada. A limited amount of exchange takes place between the staffs of certain municipal departments with municipalities in other parts of Canada often through personal acquaintances; but there is no systematic exchange, transfer and movement of staffs with a view to improving their knowledge of methods and procedures used in other municipalities. A good deal of useful information can be obtained by a direct program of exchanging municipal staffs or deliberately placing employees at work for a time in other municipalities. The upgrading of administrative competence by exchanges of personnel forms part of a current proposal sponsored jointly by the Canadian Council on Urban and Regional Research, the Canadian Federation of Mayors and Municipalities and the Institute of Public Administration of Canada.

3. Municipal Associations

The survey of municipal government departments also indicates that municipal associations and other nongovernmental associations are important sources of information. Some of these associations are not very active, failing to realize their function as information sources. It is extremely important that such associations rationalize their information exchange processes and generally improve their information services to municipalities if they are to serve a useful purpose.

4. Role of Municipal Archives

Among the most frequently cited requirements for improved access to sources of historical information in Canada is the updating of municipal record and archive services. These, in most cases, have been left unattended for many decades. Their care and organization require application of experienced staff and effective methods in indexing, arrangement and storage. These skills are insufficient in most Canadian municipalities and as yet little attention is being given to this problem. It is easier and more useful to keep doors open to historical sources as they are deposited in the course of year-by-year activities, than it is to try to regain entry to these sources after years have passed. Municipalities should therefore pay particular attention to their

record retirement policies and attempt to bring them into line with the policies practised in industry and in major government services.

5. Value of Municipal Information Offices, Properly Staffed

Municipal offices should systematize the circulation of knowledge gained both by direct exchanges and visits, and on the basis of reading and digesting published information and reports. Each department proceeding on an independent basis results in duplication and uneven information gathering. Qualified information staff are of prime importance if local municipal services are to have improved gathering, analysis and distribution of material based on their requirements. A few well-qualified information specialists could supplant an army of untrained clerks in the efficient use of information resources.

6. Libraries and Library Services

The modern function of libraries and library services in municipal departments is little understood. In many cases this is as much the fault of local libraries as it is of municipal or provincial officials. Little use is made of some of the quite excellent resources of public libraries available within Canada. The main reasons are that municipal and provincial departmental users are not generally trained in the use of libraries, and at the same time the libraries often suffer from out-of-date and outmoded methods in collecting, classifying and making available their information. The transformation of a certain number of large municipal libraries into centres for active dissemination of urban knowledge is beginning to take place. From this experience it is possible to project the costs and organizational changes needed to turn library resources in all major cities to account as basic elements in better exchange of urban information.

7. Post-secondary Teaching Institutions

There are universities and colleges in the major cities of Canada. Libraries in these post-secondary teaching institutions are vast repositories of knowledge; many are setting up sophisticated and expensive computer installations which could be used for urban information transfer. Their staffs are at once producers and sources of urban information. Their professional leadership, coupled with their facilities, can, if mobilized in this context, represent a valuable contribution by these institutions to the improvement of the urban community in which they live.

8. Use of Foreign Information Sources

The sample survey carried out on sources of material available in other countries indicated that, apart from those in the United States, only modest use is made in Canada of foreign sources. But experience outside Canada in dealing with urban problems is considerable, so the quality and quantity of these sources are important. Provincial governments and metropolitan governments within Canada should take the lead in systematically exploiting information from abroad to meet their domestic requirements. A shared program for the orderly acquisition of reports and data from major metropolitan cities in other countries, and from foreign offices of urban and regional planning should be carried out. It would be possible by such means to avoid duplication, to reduce the burden of requests from Canada upon foreign centres, and to economize in the storage and retrieval of such material once it has been secured within Canada. This is one of the tasks of a Canadian urban information clearinghouse.

9. Value of International Organizations and Agencies

An important part in information exchange is played by international agencies, both intergovernmental and nongovernmental, in the supply of basis statistical and comparative information on urban and regional developments. While a few Canadian municipalities participate in the programs of such international agencies, there are many of over 100,000 population which have as yet to utilize the services that are available from such international sources.

Information Transfer in Related Fields

1. Relation to Other Information Services Being Established in Canada

Because of the interdisciplinary nature of urban and regional studies, it is quite clear that a variety of sources of information will be required. Subjects of interest include the social sciences, health and medicine, natural and applied sciences, engineering and construction, education, law, to mention only a few. Since there are active programs at present under way in Canada in order to develop systematic information services in these fields, it is essential that municipalities and regions make themselves familiar with such programs.

2. New Information Technology

The use of the new technology of information storage and retrieval has not yet had much effect on municipal information services in Canada. While attempts are being made in municipalities, associations, universities and elsewhere to develop data systems using computers and other forms of mechanical storage and retrieval, little systematic work has been done on the automated handling of other kinds of urban information, as distinct from quantitative data. A number of projects such as the indexing of municipal by-laws or the systematic classification of reports and documents have been proposed, but little has been realized as yet.

3. Standardization of Data Inputs

The matter of standardization of data common to all levels of government is one which is of the most urgent and pressing significance. It has been pointed out that the standardization of data elements in common use, and of codes used to represent these data elements, will promote a better understanding among governments of the information being processed, will improve its reliability and enable it to be exchanged and summarized without expensive and time-consuming reprocessing arrangements.

Design of an Urban Information Exchange Service

1. Planning for Local Improvements

Small urban centres, in the range of 10,000 – 20,000 population, ca effectively improve their information gathering and analysis activitie only through some form of regional co-operation. As was pointed ou earlier in this report, such co-operation on a regional basis has been initiated in other countries. (see Appendix G). There is nothing to suggest that it cannot be effective in Canada. Certain Canadian Prov inces have already embarked in such ventures.

Among the prerequisites for the successful improvement of local information services, through increased expenditure on the one hand and shared costs on the other, must be included the following:

a. use of qualified staff;

b. investigation of the possibilities of machine based systems rathe than the continued hiring of more staff;

c. the design of new services to take advantage of information and data sources available from other jurisdictions;

d. ensuring that the product of the local information service can find its way into other municipal, regional, provincial or federal government services.

2. Urban Information Clearinghouse Services in Canada

Many institutions are both producers and users of urban information. They spend a great deal of money to collect, process and disseminate information; but in the absence of local or regional co-ordination of effort, much of this information cannot be fully used. Municipalities, while at present establishing expensive electronic data processing services, are making insufficient effort to co-ordinate these services or to obtain information on similar projects elsewhere.

To implement specialized urban programs, information often needs to be structured in specific ways. The professional and specialized people working on this kind of program need added resources so that information can be organized to meet their needs. The survey indicates that a high priority should be given to the creation of effective

clearinghouse services in each of the areas following: **(a)** urban public works; **(b)** urban transportation; **(c)** urban planning and land use; and **(d)** comprehensive municipal administration.

To answer the needs of its users and to serve them with complete and compatible information, the proposed Canadian clearinghouse should be able to answer persons in either English or French language. There are many units in Canadian urban administration that do most of their business and produce information in only one language, although supplied with and affected by information in both. Such units will benefit especially by access to a clearinghouse that is equipped to use both French and English as its working languages.

When the larger municipalities are already automating their numerical and many other records, when the pressure to take prompt administrative decisions is increasing, the importance to the proposed clearinghouse of up-to-date technology in the handling and transfer of urban information goes almost without saying.

Because the Canadian Council on Urban and Regional Research already enjoys a position of relative independence from direct government influence, because of the widely representative backgrounds from which its membership and directors are drawn, and because of the reputation it has justly earned to date, those conducting this study favour strongly a new role for the Council in which it takes the initiative in co-ordinating action with such agencies as the Canadian Federation of Mayors and Municipalities (CFMM) and the Intergovernmental Committee on Urban and Regional Research (ICURR) in the creation of a central Canadian clearinghouse for urban information.

Priorities for Action

The analysis of the data gathered during the course of this study has given rise to a long list of recommendations. These involve all levels of government, universities, municipal and other associations, industry and commerce, and even the individual citizen. It is the view of the writers that unless action is taken in certain fundamental areas little is to be gained here by extensive elaboration of detail. As a consequence the following five priorities for action **are presented with the hope that all will be acted upon.**

1. The Responsibilities of Municipal Administrations

There is ample evidence of duplication of effort among departments in municipal administrations in the collecting, processing and distribution of information both for official use and for the use of citizens. Individual municipalities must develop more adequate and more effective internal information services.

Key steps to be taken are the development of adequate criteria to guide those who are setting up new information gathering, processing and distribution tasks; the meshing of existing separate information systems; the reduction of obsolete services; and the improvement in the quality and accuracy of existing services.

Of particular importance is the adoption of standards that will permit any department of a municipal government to use information collected by another department.

2. Need for Qualified Information Staffs

Municipal officials and elected representatives must recognize the specialized nature of the information handling process together with the need for and value of qualified personnel working in this field. This need can be met by the hiring of specialist information officers and by in-service training programs. The availability of such specialists for municipal service is extremely limited at the present time, largely as a result of the lack of recognition of need for their services. Municipalities and other levels of government should follow the lead of business and universities in developing courses aimed to prepare information specialists for municipal service.

3. Intermunicipal Co-operation in Computer Use

Local government agencies within geographic or economic regions must work toward the orderly and efficient use, on a co-operative basis, of computers and other automated equipment. Independent

studies clearly support the technical soundness and economic feasibility of shared central computer systems which can provide significant improvements over present methods of information handling (see Appendix G). It is no longer a matter of choice whether or not use should be made of computers and machine methods in information handling. Substantial improvements can be achieved only by adopting such means.

4. Cost of Municipal Information

As Canadian municipalities now appear to be spending about one-seventh of their annual operating budgets on information collecting, processing, and transfer, and as this spending seems to be increasing steadily, it is essential to measure information handling requirements against expenditures as accurately as is the practice with other areas of governmental activity. Municipalities must direct more effort to determining what should be spent to provide the quality of information necessary for competent decision-making in the field of urban management.

5. Establishment of a Network and Clearinghouse for Information Exchange

The Canadian Council on Urban and Regional Research, in its already well accepted role as an initiator in the field of urban affairs, should convene, as soon as possible following publication of this report, a conference of representatives of concerned bodies including municipal associations, post-secondary teaching institutions, professional societies and the like together with spokesmen from the main governmental producers and users of urban information. The basic material for consideration at such a conference would be this report and the chief object of the consultation would be to lay the groundwork for a Canadian network and a clearinghouse for urban information exchange.

In the opinion of the authors of this report the functions of this clearinghouse would be:

a. to serve as a point through which to reach information on urban information wherever it may be located in Canada, for access and delivery in the user's language whether the original be English or French;
b. to facilitate and encourage the standardization of urban information gathering, processing and dissemination to meet the needs of Canadian users;
c. to serve as a focus and resource to aid regional groups, individual municipalities and special bodies to set up their own urban information networks and subnetworks; and
d. to act as a link with urban information clearinghouses and exchange services outside Canada.

This conference should adopt a definite plan for the first two years of operation of the Canadian urban information exchange network and the central clearinghouse services. This plan will have to involve subscriptions by the participant agencies in the network, based on an agreed, equitable and realistic scale; initially the scale may have to be related to their respective total budgets, in order to meet the costs of the services they will receive. Necessary communications, guides and directories to sources and services, whether local, regional, provincial, Canadian or international, will incur definite running costs. Determination of the formula for support of the network will be an important item of the conference's work. It is however clear that if a significant number of agencies will agree to commit a minute fraction of their present information costs to the operation of the exchange network, they will derive operational benefits of value far exceeding their subscriptions.

Glossary of Acronyms

CCURR	*Canadian Council on Urban and Regional Research*
CFMM	*Canadian Federation of Mayors and Municipalities*
CTC	*Canadian Transport Commission*
CMHC	*Central Mortgage and Housing Corporation*
DOT	*Department of Transport*
DPW	*Department of Public Works*
DREE	*Department of Regional Economic Expansion*
DBS	*Dominion Bureau of Statistics*
ECC	*Economic Council of Canada*
ICURR	*Intergovernmental Committee on Urban and Regional Research*
INTERMET	*International Association for Metropolitan Research and Development*
NRC	*National Research Council*
OECD	*Organisation for Economic Co-operation and Development*
RCMP	*Royal Canadian Mounted Police*
U.N.	*United Nations*

Appendix A Associates in the Project

Management Committee

Eric Beecroft *(Chairman)*
Meyer Brownstone
Jean-Marie Martin
Alan Armstrong *(Secretary)*

Project Staff

Project Officers
Robin Dorrell (to July 1969)
Monique Ouellette (from July 1969)

Project Secretary
Monique Henri

Translators
Diane Bonhomme
Barbara Cameron
Jacques Flamand
Marc F. Gélinas

Typists
Carol Ann Clarke
Norma Brenda Kofsky
Elaine Parent
Mary Prescott

The staff of the Canadian Council on Urban and Regional Research have been most co-operative during the entire project and their helpful assistance is acknowledged with gratitude.

Advisory Panel

John Frei (*Chairman*)
Social Planning Council of Metropolitan Toronto, Toronto

Robert Adamson
Central Mortgage and Housing Corporation, Ottawa

Jean-Paul Baillargeon
Québec Bureau of Statistics, Québec

John Banks
Social Science Research Council of Canada, Ottawa

Helen Buckley
Dominion Bureau of Statistics, Ottawa

Hugh Calkins
(then) National Capital Commission, Ottawa

Gordon Campbell
Department of Transport, Ottawa

G.A.P. Carrothers
Faculty of Environmental Studies, York University, Toronto

Pierre Cazalis
Conseil des universités du Québec, Québec

Sam Clasky
Ontario Department of Municipal Affairs, Toronto

Helen Clement
National Library of Canada, Ottawa

Robert Cournoyer
(then) Canada Council, Ottawa

Bert Elwood
Metropolitan Toronto Planning Board, Toronto

Raymond Gagné
Québec Bureau of Statistics,
Québec

W. H. Kauk
Department of Transport,
Ottawa

Paul Kitchen
National Library of Canada,
Ottawa

Paul Laliberté
Service d'aménagement du territoire de la région aéroportuaire,
Montréal

Claude Langlois
Canadian Federation of Mayors and Municipalities,
Ottawa

Henry Allan Lawless
(then) Canadian Federation of Mayors and Municipalities,
Ottawa

D.E.L. Maasland
Science Council of Canada,
Ottawa

I. F. Markson
Treasurer, City of Oshawa,
Oshawa

Robert McCabe
University of Toronto,
Toronto

J. McNairnay
Manitoba Department of Municipal Affairs,
Winnipeg

John McPherson
Canadian Transport Commission,
Ottawa

Ian Midgley
Department of Regional Economic Expansion,
Ottawa

Dennis Paproski
Economic Council of Canada,
Ottawa

D. J. Reynolds
Canadian Transport Commission,
Ottawa

Terry Shevciw
Ontario Department of Municipal Affairs,
Toronto

Martha Shepard
National Library of Canada,
Ottawa

Richard Soberman
Canadian Transport Commission,
Ottawa

W. Struthers
Central Mortgage and Housing Corporation,
Ottawa

Emrik H. Suichies
Intergovernmental Committee on Urban and Regional Research,
Toronto

Guy Sylvestre
National Library of Canada,
Ottawa

David Symons
National Capital Commission,
Ottawa

M. L. Szabo
Dominion Bureau of Statistics,
Ottawa

Appendix B Brief Summary of Methodology Employed in the Study

The study of urban information in Canada was divided into three separate but related studies: users' requirements, sources of information and a design of a Canadian urban information service. Since restrictions of time and money prevented the direct interviewing of officials responsible for urban affairs by the Expert Team, and since questionnaires mailed to a larger group of officials were not thought valid for a study of a field being explored in Canada for the first time, it was decided that interviews with a sample of officials conducted by a specialized firm would be used. In addition, briefs were solicited from urban affairs officials. Despite several efforts of solicitation, no brief of importance was received by the group of experts. Tenders were put out to Canadian consulting firms and Kates, Peat, Marwick & Co. were retained to do the sample survey of users' requirements and Canadian sources.

Users' Survey

1. Details of Sample

A sample of 92 municipal management units was selected, as shown in Table 8 (page 61), based on 65 per cent English-speaking and 35 per cent French-speaking communities and providing broad representation across 15 selected municipal functions, five Canadian regions (the Atlantic Provinces, Québec, Ontario, the Prairie Provinces, and British Columbia), and three municipal size groups (greater than 100,000 population, 25,000 to 100,000 population and 5,000 to 25,000 population). In view of the multiplicity of urban functions that could be dealt with, both the range of functions and the selection of functions were predetermined according to the three municipal size groups. These predefined functions were termed "typical" in that *they were representative of areas of decision-making and problem-solving in the urban management process.*

Because the real deficiencies and problems of the information transfer process are known better by those who are daily asked to "find out", the urban and regional information needs of the interviewed agency were sought from a range including intermediate people, rather than exclusively from the highest officials.

Experience showed that personal interviews of urban information users were indeed more suitable for this project than the gathering of survey material by way of questionnaires. Interviewers reported that in most cases much explanation had to precede the actual questions before any useful responses could be obtained. Also, face-to-face interviewing had the advantage of allowing discussion with respondents of the need for, and possible nature of improved urban information services.

The decision was made at the beginning to limit the study to those persons concerned with the *public* administration of urban affairs, as these users are the most important consumers of urban information. Representatives of federal

Table 8. Urban Management Units Interviewed

Provincial Interviews
Maritimes
Department of Municipal Affairs (Nova Scotia)
Department of Trade and Industry – Economics and Development Division (Nova Scotia)
Department of Municipal Affairs (New Brunswick)
Québec
Québec Planning and Development Bureau
Québec Bureau of Statistics (Department of Industry and Commerce)
Hydro-Québec
Department of Municipal Affairs
Ontario
Ontario Housing Corporation
Department of Treasury and Economics (Regional Development Branch)
Department of Municipal Affairs
Prairies
Human Resources Research Council (Alberta)
Department of Education (Alberta)
Department of Municipal Affairs (Manitoba)
British Columbia
Department of Municipal Affairs
Department of Highways
Department of Health (Division of Vital Statistics)
Federal and Association Interviews
Canadian Federation of Mayors and Municipalities
Department of Transport
Department of Regional Economic Expansion
Central Mortgage and Housing Corporation
Department of Manpower and Immigration
Union of Nova Scotia Municipalities
Association of Ontario Mayors and Reeves
Royal Canadian Mounted Police
Ontario Municipal Association
L'Union des Municipalités de la Province de Québec
Canadian National (Railways and Communications)
Department of Public Works
Centre for Urban and Community Studies (University of Toronto)
British Columbia Teachers' Federation

Functions Interviewed in Specified Municipalities

	1,000 Population (1966)	Public Works	Roads and Streets	Traffic	Permits and Inspection	Land Use	Police	Welfare	Recreation	Transport	Education	Mayor	Manager	Finances	Assessment	Personnel	Fire	Clerk	Health	Intergovernmental
Metro Toronto	2,159	x	x	x	x	x	x	x	x	x	x	x	NA	x	x	x		x		
Edmonton	377	x	x	x	NA	x	x	x	x	x	x	x	x	x	x	x	x		x	x
Québec (including cost study)	167	x	x	x	x	x	x	x	x	NA	x	x	x	x	x	x			x	
Etobicoke (cost study)	220	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	
Burnaby	112					x									x					
St. Catharines	97								x	x										
Thunder Bay	98				x							x								
Halifax	87						x								x					
St. John's Nfld.	80			x												x				
Verdun	77	x								x										
Hull	60						x									x				
Kingston	59			x				x												
Victoria (cost study)	57	x	x	x		x	x	x	x	x	x	x	x	x	x	x				
Guelph	51		x		x															
Moose Jaw	33		x								x									
Chicoutimi	33												x	x						
Shawinigan	31					x								x						
Brandon	30							x							x					
Red Deer	26	x											x							
Drummondville	29	x																		
Woodstock	24										x									
North Bay	24					x				x										
Stratford	23					x														
West Kildonan	22			x																
Thetford Mines	22						x													
Fredericton	22							x												
Charlottetown	18				x															
Ste. Thérèse	16														x					
Swift Current	14															x				
Portage La Prairie	13													x						
Kamloops	11					x						x								
Kenora	11								x											
Selkirk	9		x																	

Appendix B

nd provincial governments were therefore included in the sample, as well as ertain municipal associations. The list of non-municipal interviews shown in Table 8 (page 60) also includes an academic user of urban information.

2. Interview Structure

The interviewers were provided with an interview schedule, which had been pretested in a series of pilot interviews. They were free to depart from the schedule and conduct "open" interviews where necessary. Questions asked followed this outline:

- community and agency characteristics
- level of education of respondent
- area of jurisdiction of the agency
- relationship with other organizations
- activities of the agency
- information needs
- information handling and related problems
- proposed improvements
- comments on an information service
- additional comments.

Sources Survey: Canadian

The primary aim of the sources survey was to identify sources in Canada along with their related systems and networks, to review modern methods of information handling and to examine the handling of urban data.

The survey was broken down in phases, the first of which was the identification of urban information sources in Canada. In the second phase, consultants investigated and described existing sources, systems and networks. Although this survey was independent from the users' needs survey, useful data on sources were obtained from users and included in this study. Sources were divided into those dealing exclusively with urban information, and those dealing with general information, which includes urban information. The accompanying systems were to be analysed to determine responsibility for operation, financing, up-dating, how decisions on scopes and functions were made, and how communications problems were resolved. Five sources were singled out for closer study. Results were integrated and analysed in a last phase.

Sources Survey: Retrospective and Foreign

The services of Mrs. Cynthia Bled, librarian and teacher of urban economics, were retained for the study of sources of retrospective data in Canada, as well as foreign sources used by Canadians.

Most of the information gathered by Mrs. Bled in her study of sources of retrospective data and information was done through literature searching and discussions with persons working in the area of urban affairs. No effort was made to present listings of works in the various fields covered, or to give detailed identification of the institutions mentioned. Rather, the study serves as a key to the types of source that exist. As such the main bibliographies or indexing sources in a field are mentioned, and the types of government and private information sources available. The identification of sources has been related to functions in urban affairs.

As to foreign sources of urban information, the Expert Team wanted indication of the chief suppliers of urban information to Canada – the type of information and form in which supplied. Approximately 200 foreign sources were asked for information as to the nature of their output. Of the institutions that responded, a selected number were contacted a second time for further details and an indication of their Canadian market. From the United States and Western Europe responses came from approximately ninety per cent of those asked.

Forty-seven readily available urban studies by Canadians were examined to check the origin of references cited. Foreign sources mentioned by Canadian users were also taken into account. Lists of periodicals received by provincial Departments of Municipal Affairs, by a number of municipalities, federal agencies and other institutions provided supplementary information.

Canadian links with foreign sources of urban information turned out to be so extensive that the survey merely mentioned the sources revealed, rather than study them all in detail. When multiple citations revealed a foreign source was of primary importance, an effort was made to give additional information on that source. Six foreign urban information sources were selected for closer analysis, serving as examples of types of service now available in urban affairs. Some of this analysis had to be prepared from summary documents at hand in the time available.

Appendix C Sample Survey of Current and Retrospective Sources of Urban Information Used by Municipal Departments

The survey of 92 municipal departments of local administrations in 30 cities and towns in Canada revealed something of the information sources habitually used by these departments for current information. Because the interviews were based on a small sample of individual departments, it is likely that many sources used in other municipalities have not been mentioned; some other sources may be as important as those cited. This Appendix records some sources indicated by respondents, and gives some comments on the value and use of the sources named. A suitable guide to information sources for Canadian urban use has still to be prepared.

A separate survey of sources of retrospective information was carried out; the information from that survey has also been included.

The arrangement of this Appendix by municipal administration topics is as follows:

Permits and Inspections
Transport
Roads and Streets
Personnel
City Manager
Civic Administration
Transportation
Assessment
Finance
Planning and Land Use
Education
Health & Welfare
Environmental Services, Pollution Control
Economic Development
Building and Construction
Public Works
Municipal Laws and Regulations.

Permits and Inspections

Major Sources for Current Information

Occasional contacts with provincial departments were reported, e.g. Highways, Labour (with regard to safety regulations). The National Research Council (Ottawa) furnishes a building code. Associations mentioned as sources include the National Safety Council, Ontario Building Officials' Association, National Taxicab Association (U.S.).

Transport

Metropolitan Toronto is unique among interviewed units in that the Toronto Transit Commission (TTC) Planning Division has a small library which gathers reports of projects in the Metropolitan area on traffic and related aspects. There are enough groups within Metropolitan Toronto to generate the basic information required, and these reports form the essential material for planning, in addition to the TTC's own continuous surveys.

Geographical Spread of Sources Required

Large cities rely heavily on American sources, e.g. U.S. Government Departments and major U.S. cities. Agencies like the Institute of Rapid Transit and the Highway Research Board are key sources. In Canada, apart from selected large municipalities, the prime contacts are with associations such as the Canadian Transit Association and the (U.S.) Institute of Traffic Engineers.

Roads and Streets

This Department generally has major interaction with the following other civic departments:

- planning – for overall plans covering land use and transportation;
- public works – regarding design and construction of facilities;
- police – accident locations.

Interaction with transit authorities was reported in some instances. There is considerable interaction with several provincial departments such as Highways and Transport – regarding information on planning and financing. At the federal level, interaction is primarily with the Department of Transport and Canadian Transport Commission (e.g. railway crossing elimination) and with Public Works (e.g. navigable waters).

Major Sources for Current Information

Associations noted include City Engineers Association (courses), Canadian Good Roads Association (courses and publications), Institute of Traffic Engineers, Canadian Association of Professional Engineers, Canadian Federation of Mayors and Municipalities (Transportation Conference 1969), and Ontario Traffic Conference (courses).

Sources reported in the U.S. include Highway Research Board (conferences and publications), American Public Works Association (courses, conferences and publications), and Committee for Economic Development (publication). Consultants are used by most respondents for projects requiring specialized

echnical knowledge. Only one city in the sample mentioned contact with a niversity (University of Guelph, Engineering Faculty).

Personnel

Sources of Current Information

None of the municipalities visited has comprehensive computerized personnel files. The primary requirement in all functions interviewed is for up-to-date information on wage and working condition agreements in Canadian cities, or in the immediate region or Province. The variables most needed here are wages, salaries, fringe benefits and general personnel information.

The larger cities maintain a wide range of contacts with other municipalities, the Dominion Bureau of Statistics, and associations. Toronto is the only respondent reporting U.S. sources. One other large city uses Queen's University's computer print-out of labour contracts by subject clauses. The Canadian Federation of Mayors and Municipalities (CFMM) does an annual wage and salary survey of municipal employees, used by several municipalities.

Administrative Head

Sources of Current Information Cited

The municipal departments within each municipality are the primary sources and recipients of information. At the Provincial level, the Departments of Municipal Affairs dominate the interchange, but there is also occasional exchange with other departments (e.g. Health, Education, Highways) on specific projects.

Small cities' contacts are essentially with the Provincial government and with other cities in the immediate area. Larger cities deal extensively with their provincial government, other larger Canadian municipalities and with both Canadian and U.S. associations, for example, the American Management Association, the Canadian Federation of Mayors and Municipalities, and the International City Management Association.

Periodicals and newspapers are important to all city managers. Consultants and universities were noted as important sources for cources and surveys.

Civic Administration

(a general area serving numerous departments)

Sources of Retrospective Information

a. Basic collections on local government administration, such as the Municipal Reference Library, City Hall, Toronto;
b. the Canadian Federation of Mayors and Municipalities, Ottawa;
c. university studies and research. Queen's University, Memorial University of Newfoundland, Université Laval, the University of British Columbia, Alberta, Saskatchewan, Manitoba and Dalhousie (Institute of Public Affairs) among others, were cited as sources of programs in municipal administration and have collected data in the field;
d. published monographs and reports: *The Canadian Municipal System: essay on the improvement of local government* by Donald C. Rowat, 1969, was singled out for its comprehensive coverage of the whole municipal system in Canada, and its 34 page bibliography;
e. the *Proceedings* of the Institute of Public Administration of Canada present most useful insights into public administration in Canada;
f. useful information can also be obtained from the Proceedings of the various associations of municipal officers in Canada, such as the Association of Municipal Clerks and Treasurers of Ontario.

Transportation

A basic source of retrospective data on transportation in Canada is the Dominion Bureau of Statistics, which centralizes information from:

a. Department of Transport
b. National Harbours Board
c. St. Lawrence Seaway Authority
d. Department of Public Works
e. annual reports of municipalities
f. reports of provincial departments
g. its own surveys.

From these sources the Bureau consolidates information on road and street mileages, motor vehicle registrations, motor transport traffic, traffic accidents, passenger bus statistics, urban transit, international toll bridges, tunnels, ferries, etc.

The federal Department of Transport has historical records on transport in Canada, and its library will offer limited reference services.

Royal Commissions of the Government of Canada reports have brought

ogether useful information in the area of transportation as in many others. mportant Federal Royal Commissions have reported on transport in 1873, 917, 1951 and 1962.

Records of the *Judgments, Orders, Regulations and Rulings* of the federal oard of Transport Commissioners (now the Railroad Transport Committee f the Canadian Transport Commission) provide information relating to rail- ays, telephone rates and express truck routes.

The Traffic Injury Research Foundation has prepared a *Traffic accidents* nedical bibliography 1955-1964, published by the Department of National Health and Welfare, Ottawa, 1966. Another useful bibliography is *Transpor- ation in Canada and the United States – a bibliography of selected references 965-1969* by the Center for Transportation Studies, University of Manitoba.

Provincial Departments of Highways operating under the Motor Vehicle Transport Act of Canada since 1954, are sources of information for a wider ange of transportation activities within the respective Provinces. Ontario's Department of Highways, for example, has conducted studies on urban con- necting links, rapid transit, control of access, etc., and has an Historical Re- search Section engaged in research, documentation, and historical narratives.

The annual reports of local departments of roads and streets as well as muni- ipal minutes, by-laws and regulations are sources of information. However, ransportation cuts across many jurisdictions and entails a variety of admin- istrative patterns across the country. Depending on the information required, he Department of Municipal Affairs might be the best source at the start of n inquiry.*

The *Road Reference Library Catalogue* of the Roads and Transportation Association of Canada (formerly Canadian Good Roads Association) pro- vides a source for retrospective searching. The Association has also conducted number of special studies on, for example, *Urban Transportation Develop- ments in Eleven Canadian Metropolitan Areas,* and is to be consulted when historical data are sought. Its reference library is small but resourceful. It publishes *Road Research in Canada* biennially.

*For a concise picture of provincial variations in the administration of roads, ee "The Financial and Administrative Responsibility for Municipal Roads Fringing Urban Areas". Paper by George S. Mooney, Executive Director, and Eric Beecroft, Director of Planning and Development of the Canadian Fede- ration of Mayors and Municipalities, for the 41st convention of the Canadian Good Roads Association, October 19, 1960.

Assessment

Major Sources for Current Information

There was little direct provincial government involvement among the munici- palities interviewed in assessment procedures except in the Province of Ontario. Informal comparison of procedures is substantial, but only in the immediate region. Wider informal contacts are less frequent and occur mostly at con- ferences of associations such as:

- Appraisal Institute of Canada
- International Association of Assessment Officers.

Finance

1. Major Sources for Current Information

Larger municipalities make substantial use of the Municipal Finance Officers' Association of the United States and Canada. Smaller centres make use of Canadian information through contacts with members of municipal associa- tions, e.g. Association of Municipal Clerks and Treasurers.

2. Retrospective Information Sources

The Dominion Bureau of Statistics maintains records of revenue, expenditure and debt structure of federal, provincial and municipal governments (as totals). Federal and provincial taxes and rates are also identified in addition to those applying to selected municipal administrations.

The federal Department of Finance, through its records of performance under the Small Business Loan Corporation and the Municipal Development and Loan Board can supply some information on the financial position of a muni- cipality. The Bank of Canada and commercial invest.nent dealers report on municipal borrowing, etc.

Provincial Departments of Municipal Affairs are perhaps the best sources of retrospective information on the financial status of municipalities. Many of these departments focus their attention on financial performance. The Ontario Department has as a main role, in addition to compiling municipal statistics, to prescribe financial record keeping and to ensure that proper auditing and financial reports are made. The Québec Bureau of Statistics' annual of muni- cipal statistics shows for most of the approximately 1633 municipalities in the Province, population, acreage, number of owners, tenants, spending on home improvement, net debt of municipality, per capita net debt, average incomes, tax revenue, valuation total and per capita expenditures.

Municipal records – annual reports, minutes, by-laws – provide a source of

Appendix C

nformation, though these are rarely indexed in a thorough manner.
Recent local finance surveys of historical significance, brought out in recent ears, include the following:
New Brunswick – Byrne Report: 1963
Manitoba – Michener Report: 1964
Saskatchewan – McLeod Report: 1965
Québec – Bélanger Report: 1966
Alberta – Aalborg Report: 1966
Ontario – Smith Report: 1967
Basic historical information is also contained in regular reports of the Dominion-Provincial Conferences on Municipal Statistics, dating back to 1933.

Planning and Land Use

1. Sources of Current Information

In smaller centres, only a few sources were mentioned, including a branch of a provincial Department of Municipal Affairs, a major consultant, a Regional Planning Board, and a few periodicals and associations.
The land use function is particularly concerned with data. Among the predominant types of data required are:
- social (vital statistics, census)
- physical environment (climate, topography, geology, etc.)
- housing (production, policies and standards – CMHC)
- transportation (generation rates, flows, modal splits, etc.)
- economic base (manufacturing, income, locational factors)
- education (school sites, teacher requirements, types of education, etc.)
- assessment (land values, locations, use, etc.)
- forecasts of key developmental variables (time series information – population, employment opportunities, income).

2. Sources of Retrospective Information

Land use patterns can be tediously determined from zoning and subdivision records in departmental reports, minutes and by-laws of a municipality. In recent years the potential of assessment records to yield historical trends in land use has grown because of computerized record keeping in an increasing number of municipalities.
Provincial intervention in the assessment field is now being initiated by a number of provinces. The resulting centralization and possible intra-provincial standardization may facilitate retrospective searches in the future.

Education

Education Boards in larger cities mentioned a wide range of needs for information. For example, such needs included:
- population projections
- pupil enrolment history
- housing starts and completions
- changing land use patterns and densities
- provincial grants and regulations
- pupil-teacher ratios
- transportation impact on pupil travel patterns
- student profiles
- impact of new programs on pupil achievement.

1. Major Sources for Current Information Cited

All respondents reported that the relevant provincial Department of Education stands out as their main source of information. Among the Associations reported as very important sources in smaller centres, but not in larger ones, were the following:
- Canadian Education Association
- Saskatchewan School Trustees' Association
- International Reading Association
- Saskatchewan Teachers' Federation
- Ontario Public School Trustees' Association
- Ontario Education Association
- National Association for Secondary School Principals
- Ontario Teachers' Federation
- Association of School Business Administrators (U.S.)
- National Education Association (U.S.)

2. Sources of Retrospective Information

The Dominion Bureau of Statistics is a main source of retrospective data relating to educational finance, enrolment, staffing, etc., through its Census and special surveys. Some problems in use arise from incompatibility on points of detail from one Census to the next. Besides, desirable breakdowns at the provincial level are not always available.
Local municipal administrations, as well as provincial Departments of Education and Municipal Affairs, also keep records on previous education history. Many provincial Departments of Education have carried out and are carrying out studies on trends and evaluation policies. For example, the Ontario Department of Treasury and Economics is engaged in a series of analytical studies for the Ontario Department of Education.

The Canadian Council for Research in Education (Ottawa) publishes the *Canadian Education Index – a guide to books, periodicals and reports on education in Canada,* which is a valuable source for locating retrospective material.

Health & Welfare

1. Sources for Current Information

There is generally little detailed awareness of what other cities are doing. The little that is known is usually obtained from attendance of staff at periodic conferences of associations such as:

- Welfare Officers' Association
- Canadian Council on Social Development (formerly Canadian Welfare Council)
- Canadian Association of Social Workers
- Canadian Conference of Social Welfare
- Ontario Association of Children's Aid Societies.

Where local universities have faculties related to social services (e.g. psychiatry, medicine, psychology, sociology, social work) there is co-operation in terms of research and consulting.

2. Sources of Retrospective Information

The Dominion Bureau of Statistics is a basic source of centralized statistics on hospitals and related institutions and facilities. The Department of National Health and Welfare has general information on activities and developments in the field, based partly on information supplied by the Dominion Bureau of Statistics, as well as that collected from its own grant records and surveys for calculating trends and patterns. Information is not kept at the level of municipal identification, but any local government body can have direct access to the Department for consultative purposes. Provincial Health Departments and regional health and hospital boards have much to add.

For a regional approach to health statistics, the provincial Departments of Health are the best sources. These departments also keep records of local public health authorities.

The Senate Special Committee on Poverty has recently conducted a survey of social and welfare activities across Canada with emphasis on innovative approaches. Notes and working documents associated with the survey will eventually be released for public use.

The Canadian Council on Social Development (Ottawa) has prepared basic bibliographies on poverty in Canada. The scope of this Council as a reference source extends beyond that of poverty, however, and its library has historical data in the general area of social services in Canada.

Reports of the various metropolitan and local Social Planning Councils are usually available in municipal public libraries, although these are not always kept for historical purposes. The Municipal Reference Library, Toronto, keeps on file all social and voluntary agency annual reports which have relevance to the Metropolitan Toronto Council's work.

Environmental Services, Pollution Control

(Water, Sanitary Services)

The former federal Department of Mines and Technical Surveys had a store of information on ground water studies, and had co-operated with provincial departments in studies of their water resources. The Department now has been reorganized as the Department of Energy, Mines and Resources, and the records are scattered. At the provincial level, various departments and agencies deal with water services and problems. The Ontario Water Resources Commission is one of the oldest and best equipped of these. In Québec, the Québec Water Board, established in 1965 under the Department of Municipal Affairs to handle municipal water problems and to facilitate implementation of water purification measures, is a centralizing source of information. At the same time, Québec's Department of Health, Sanitary Engineering Division, has research data on water pollution. The Prairie Provinces Water Board co-ordinates information in that area.

While the various provincial departments and agencies might be used for information on pollution control, the best centralized reference source for this type of information is the Canadian Council of Resource Ministers (Montréal) which not only receives information on the activities of all the Provinces but is itself engaged in programs of research.

The Acoustics Section of the Division of Physics, National Research Council (Ottawa), has an inventory of studies and findings on noise control.

For municipal records on sanitary services, these can be checked though annual departmental reports and minutes at the city level, or in summary form with the Departments of Municipal Affairs.

Economic Development

Data required for economic development can be grouped into two general categories:

a. information for prospective investors;
b. information for departmental planning purposes.

a. Information for prospective investors is related to the natural resources; services such as schools, hospitals, recreational facilities; economic incentives

and tax rates; climate; labour force characteristics and labour history; etc.

b. Information for planning purposes is in large measure related to experience elsewhere, as well as an application of theories to resource data. To quote the late first Executive Director of the Canadian Federation of Mayors and Municipalities, George S. Mooney, "it is helpful to know what others have done and then be fortified by what appears to be good practice and forewarned by what appears to be bad".*

Provincial departments of economic development are the best sources of retrospective information here. The Ontario Department of Treasury and Economics, Regional Development Branch, maintains a file on economic planning experiences in Ontario, the United States, and other Canadian Provinces, which is available for consultation. The Department has also consolidated sections of the *Statutes of Ontario* relating to regional development and intermunicipal co-operation. Economic information and trend indicators for Ontario's economic regions and selected urban areas are presented in the Department's *Economic and Statistical Review*.

The Canadian National Railways have built up an appreciable inventory of economic research reports on small communities.

Building and Construction (Including Housing)

Sources of Retrospective Information

For trends of residential construction based on starts and completions, the Dominion Bureau of Statistics has information identifiable by municipalities with populations of 10,000 and over. For smaller areas, trends are identifiable through building permits issued. Reports on these are gathered by the Bureau for 1,400 municipalities irrespective of population size. Data based on the issue of permits reflect construction activities where 94 per cent of the urban population is found.

Housing statistics for areas with populations of 10,000 and over are obtainable through Central Mortgage and Housing Corporation which also keeps track of mortgage lending. The Corporation can provide general information on housing and renewal, working closely as it does with provincial and local authorities. Nearly every Province has established its housing agency. Provincial Departments of Municipal Affairs are also reference sources on building records and are in close touch with the housing agencies.

Municipalities maintain records of construction in their own areas, and determine their own building standards. Most have accepted, in some form or other, the National Building Code and Building Standards of the National Research Council (Ottawa). The Division of Building Research of the Council has published bibliographies on certain aspects of housing and site planning.

Public Works

Major Sources for Current Information

Generally, Canadian and U.S. Engineering Associations related to public works are widely used as information sources. Periodicals appear to be the next most important sources of information.

Metropolitan Toronto is unique in that it has enough resources to engage in an analysis of information received. It often acts as a source of information for other cities in North America and abroad. Metropolitan Toronto has the only Public Works Department with an organized library reported in the survey.

There is little evidence of organization of public works information sources in other cities. In some public works departments there are large numbers of unclassified reports, advertisements, periodicals, which require organization in order to make them of use.

Municipal Laws and Regulations

Laws and Regulations affecting urban affairs can be identified through the following sources:

a. City By-laws;

b. Provincial Laws, Statutes, etc. which are published for each Province, and which can be searched for specific regulations;

c. Provincial Gazettes;

d. Federal Laws, Statutes, etc., the published *Acts of the Parliament of Canada;*

e. the *Canada Gazette* which lists all the orders, rules, regulations, by-laws and proclamations of a legislative or administrative nature;

f. debates of the House of Commons and the Senate. The indexes to these are very thorough.

City By-laws are best checked through the City Clerks and provincial Departments of Municipal Affairs. Not all municipal libraries have complete sets of By-laws. Provincial Legislative libraries will usually have complete sets of the publications mentioned above other than city By-laws.

Municipal Assistance to Industry – A Canadian study of tax concessions and other inducements, by Stewart Fyfe. Joint publication of the Institute of Public Affairs of Dalhousie University and the Canadian Federation of Mayors and Municipalities. (n.d., ca. 1961) p. 1.

Appendix D Selected Sources of Urban Information Outside Canada

International Agencies

1. Governmental

OECD. Canada has been an increasingly important participant in international arrangements for the dissemination and exchange of information. At the intergovernmental level, we have been active in the Organization for Economic Cooperation and Development (OECD), a key agency in varied aspects of urban affairs. Activities of the Committee on Research Cooperation of the OECD are centred around subgroups such as the Study Group on Innovation in Urban Management. This group is currently conducting a study which will offer an international spectrum of developments in the creation of data banks, management information systems, urban intelligence systems, social accounting, city and regional income, expenditure and accounting systems, cost/benefit analysis, planning and budgeting procedures, use of various statistical techniques, computer applications for information retrieval, traffic control, etc.

U.N. As a member of the United Nations, Canada benefits from its varied activities in the field of urban and community development. The Committee on Housing, Building and Planning of the U.N. Economic Commission for Europe has recently compiled a *Directory of National Bodies Concerned with Urban and Regional Research* which serves as a basic specialized reference tool to persons in the field.

IDCHEC. A significant step in international exchange of urban documentation was taken with the establishment in 1970 of an Intergovernmental Documentation Centre on Housing and Environment for the Countries of the United Nations Economic Commission for Europe (IDCHEC). This Centre has been piloted to fruition by the French delegation to the Committee on Housing of the United Nations and has received some encouragement from Canada. IDCHEC offers at the international level the pattern of a centralized data bank which Canada could well study. This bank will develop a system of information storage and retrieval in the multi-faceted area of urban and regional affairs. Participating countries will feed data to the central service in France, and by 1973 it is expected that inquiry arrangements should be completed, linking the countries to the system. Non-technological aspects of housing, urban and regional development, and the environment in general will be covered – socio-economic, cultural, administrative, financial, cultural and statistical. Data will be collected, translated, processed and supplied on request. National documentation centres and organizations will serve as access units for persons from any country participating.

2. Non-governmental

CIB. The IDCHEC will be complementary to the International Council for Building Research, Studies and Documentation (CIB) in The Hague, a non-governmental agency which concentrates on essentially technical information about building and construction. The CIB has recently established a network of information centres so that in each member country there is an address to which inquiries for building information can be directed. The Council's contact in Canada is the National Research Council, Division of Building Research.

IULA. A further nongovernmental source is the International Union of Local Authorities (IULA) in The Hague. This is a body with membership from 60 countries, and on which Canada is represented, having a seat on the Executive Council. Its biennial international congresses (the next to be held in Canada in 1971), are important exchanges for members. Its monthly *Newsletter,* in French and English, keeps members abreast of activities. Another publication of IULA, the semi-annual *Comparative Local Government,* is published in English only.

ICMA. The International City Management Association (Washington, D.C.) is another important organization in which Canadian municipal officers participate. Under a recent grant from the U.S. Department of Housing and Urban Development, the Association is working with various groups to assist local governments in the research, design and development of urban information systems. It will be preparing reports dealing with the "State of the Municipal Information System Art", and "Primer on Municipal Information Systems", as well as contributing to the implementation of systems based on the experience derived from the project.

A current calendar of the International City Management Association events includes two Canadian meetings out of eight listed – a meeting of the Association of Municipal Managers of Québec at Dorval, and the Ontario Municipal Administrators' Association meeting in Timmins. It should be mentioned that while this Association is named "International", it is United States based, and apart from Canadian participation, is essentially U.S.-oriented.

Other nongovernmental agencies

The Municipal Finance Officers' Association of the United States and Canada and the International Association of Assessing Officers are important sources in the area of finance. So also is the International Information Centre for Local Credit Information. Canada is a member of the International Union for Conservation of Nature and Natural Resources.

Other international sources frequently cited by users are the International

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oad Federation and the International Geographical Union. These are espe-
ally important for the contacts afforded at the annual conferences, and in-
rmation obtained from the published proceedings. The International Road
ederation held its 6th World Meeting in Montréal in 1970. The International
eographical Union's 1972 meeting is to be held in Canada.
Much valuable information is secured from the International Municipal Signal
ssociation. The International Congress on Criminology was also cited as a
seful source of information. In the International Association of Fire Chiefs,
anada stands as a Division. Canada is also represented in the International
ssociation of Fire Fighters.
The International Institute of Municipal Clerks has Canadian members, and
roposes to give more Canadian coverage in its *News Digest.*

ational Sources

he United States of America

. Governmental Agencies

n a survey of national sources of urban information outside of Canada, the
redominance of United States sources stands out clearly.

The Library of Congress Referral Service. A central source in the U.S. is the
ibrary of Congress National Referral Center for Science and Technology
which has a register of over 10,000 research centres in the United States in all
aspects of science and technology, and provides information on their names,
ddresses and telephone numbers. The National Referral Center is well equip-
ed to keep up to data with agency changes. The efficiency of the Service de-
pends, however, on the co-operation of the various U.S. centres in supplying
nformation.

Other National Centres. While the Referral Service functions to identify insti-
tutions and their areas of activity, there are a number of national centres which
must be singled out for their peculiar interests in keeping abreast of the output
of researchers and of data-producing agencies and sources. Significant among
these as urban information sources are:

- Educational Resources Information Center (ERIC), Washington
- Environmental Control Administration, Washington
- National Technical Information Service, Bethesda, Maryland
- U.S. Department of Housing and Urban Development (HUD), Clearinghouse Service, Washington
- Air Pollution Technical Information Center, Washington
- Water Resources Scientific Information Center, Washington
- Science Information Exchange (SIE), Smithsonian Institution, Washington, D.C.
- Highway Research Information Service, Washington.

U.S. Government Departments. In addition to the federal information centres mentioned above, U.S. government departments at different levels serve as sources of urban and regional information used in Canada.

U.S. Bureau of the Census data and population reports figure significantly in Canadian studies. Other U.S. federal departments which have been mentioned as important sources of information include the Bureau of Public Roads and the Department of Commerce; the Bureau of Sport, Fisheries and Wildlife of the Department of the Interior; the Department of Health, Education and Welfare.

The role of the U.S. Government Printing Office as a disseminator of the U.S. Government documents is of importance.

Another source at the federal level is the Federal Bureau of Investigation, which has an information exchange with the Royal Canadian Mounted Police. The "Uniform Crime Reports" of the Federal Bureau of Investigation illustrate the effective use of the computer in centralizing collection of statistics. The National Crime Information Center is linked by computer with 15 local and State computers representing metropolitan area and State-wide systems, and the system is expanding. The adoption of national standards to facilitate the functioning of this system does not seem to have hindered efficiency of local information flow; on the contrary, it may have contributed to increase efficiency at all levels. This is a model which should be looked at in the interest of information flow.

State Departments. At the State level, the New York State bi-monthly *Statistical Reporter* serves as an important reference on studies projected, under way, or completed by or under the sponsorship of N.Y. State agencies. Important information emanates from this State's activities. Attention should be focused, for example, on the co-ordinating and guidance roles of its State-wide Information Systems (SWIS). Another progressive step is the introduction of an automated State-wide interlibrary loan program (NYSILL) to meet the needs of agency research personnel.

Planning and development news from a number of States have proven a useful source of reference. These have included: Connecticut Interregional Planning Program, through the *CIPP News;* Connecticut Development Commission, its *Connecticut Planning;* Northern Kentucky Area Planning Commission, its *Newsletter;* New Jersey Department of Conservation and Economic Development, its *Jersey Plans* and *Newsletter;* California Department of Parks and Recreation, its *News and Views;* etc.

Municipal Departments. Considerable sources of information are to be found in the activities of city and metropolitan governments in the United States. Reports of special operating bodies such as the Port of New York Authority have been singled out. Commissioned studies are useful sources of reference here, especially, in the area of traffic and transportation. Reports on intergovernmental relations (e.g. Denver); real property investments (e.g. Metropolitan Cleveland); transit studies (e.g. Metropolitan Washington); planning (e.g. Rhode Island Planning Division publications) are indicative of the types of material available.

2. Nongovernment Associations and Agencies

In addition to the national centres operated by the U.S. government, a number of nongovernment centres are of importance as sources of urban information on research and data. They include:

- Urban and Regional Bibliographic Information System (URBIS), Kent State University, Ohio
- Planning Advisory Service (PAS), Chicago
- National Association for State Information (NASIS).

Much information is obtained in Canada through the operations of nongovernment research agencies and professional associations in the U.S. Each of these categories is considered separately below.

Research Agencies. A conservative estimate would put the number of research agencies in the United States involved in urban studies at 300. Some of these, the output of which is reportedly most used in Canada, include the following.

The Urban Land Institute (ULI) plays a significant role as a source of information for Canada through its *Technical Bulletins, Research Monographs,* reference texts, and the monthly bulletin of news and trends in city development, *Urban Land*. The Institute is an independent research organization dedicated to improving the quality and standards of urban planning, development and redevelopment through the dissemination of practical information on land use.

Three Councils guide the ULI's work. These are the Community Builders Council, the Central City Council, and the Industrial Council, each of which is headed by a 30-man Executive Group. There is a Canadian representative on each Council, one from Québec and two from Ontario. Of the 4,800 paid up ULI members as of June 1970, 309 have Canadian addresses.

Stanford Research Institute was frequently mentioned as a source of information. This body accepts both U.S. and foreign requests for studies in regional development programs, and has been engaged in research activities in Canada. Regional economics, manpower development, industrial development, location analysis and community development fall within its scope.

Resources for the Future (RFF), a nonprofit corporation supported by The Ford Foundation, is noted for its publications. The agency is actively engaged in the promotion of training and research in areas of environmental quality, water resources, land use and management, regional and urban studies, among others.

Professional Associations. Professional associations provide an important link between Canadians and their American counterparts. A questionnaire to over 100 U.S. sources asked each source to identify its target clients as regional/localized, national or international. Apart from those of localized interest, a surprising number of replies were in effect: national, including Canada. Some indicated national, and proceeded to comment on their Canadian clientele. To get a thorough evaluation as to the extent to which Canadians are dependent on United States sources of information, a study would have to be conducted with this in mind.

Some of the principal associations with which persons in Canada in the area of urban and regional affairs are associated include the following: American Association of State Highway Officials; American Society of Planning Officials; National Fire Protection Association; American Institute of Planners; American Institute of Landscape Architects; American Public Works Association; American Transit Association; American Public Welfare Association; Building Officials' Conference of America; Federation of Tax Administrators; International Association of Assessing Officers; International Institute of Municipal Clerks; Municipal Finance Officers' Association; Public Personnel Association; Public Administration Service.

Libraries. The role of libraries as sources of information transcends the traditional concept of "keeper of books and documents" to an active part in the information dissemination process. No effort was made to pinpoint United States urban-oriented libraries with which Canadians are in contact, but there are a few which stand out. The Transportation Center Library of Northwestern University, for example, publishes its accession list as the monthly *Current Literature in Traffic and Transportation*. This is not an informal accession list for library exchanges and staff use, but an internationally oriented classified list averaging 300 items per issue and including addresses of periodicals. The Library also publishes select bibliographies, a recent one on *Urban Transportation: Developments Outside the United States* containing 1,017 entries.

Recent Publications on Governmental Problems published by the Joint Reference Library of the Center for Public Administration (Chicago) is indicative of the key roles libraries can play when they co-operate in the interest of the information process. This semi-monthly publication offers 5,000 listings per year, based on the accessions of various co-operating institutions.

Highways Current Literature Library of the U.S. Bureau of Public Roads (Washington), serves as an accession list as well as an index to current journals.

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New York City Municipal Reference Library puts out a monthly *Municipal Reference and Research Center Notes*. Many city, State and federal departments put out accessions lists which can be had on request, some free, some on exchange, others with paid subscriptions.

The Council of Planning Librarians serves as a co-ordinating body and brings librarians together for exchange of ideas. Most of the larger planning offices and many university libraries in Canada belong to this body and benefit from its *Exchange Bibliographies*. These bibliographies are issued 2 to 5 times per month, and provide current and retrospective information on planning and related fields. A recent issue puts the role of the Council in perspective. Entitled: "Planning Library Aides: A Guide to Information Sources, Libraries and Classification Systems for Operating Agencies and Consultants", it is introduced as intending "to show new planning librarians how others have attempted to solve the problems of organizing, collecting and classifying material of interest to agencies. . ." Federal publications, general information sources and indexes as well as planning libraries and classification schemes are covered. The Council has also published a *Directory of Libraries* which covers planning libraries in Canada and the United States.

Universities. One United States university which stands out for its impact at the operating level is Northwestern University, noted for the publications and courses originating from the Transportation Center. To stop at this point, however, would be grossly to underestimate the potential of the universities. Many of the periodicals which have been singled out as being useful have university professors as editors. There are information centres such as the Urban and Regional Bibliographic Information Service mentioned above, which operate out of universities. The *Quarterly Digest of Urban and Regional Research* published by the Bureau of Community Planning of the University of Illinois is a well-used source in Canada.

Universities have, however, contributed more as research centres than information centres. A number of them are now trying to play the two roles more equally.

The Council of University Institutes for Urban Affairs was set up in 1970 with representation from at least one Canadian institute of urban studies. There is a desire on the part of the Council for membership of Canadian institutions. Alternatives are now being explored as to how the Council might function as a clearinghouse of information on university urban affairs programs. In addition, the Council proposes to work in collaboration with another newly formed agency, the Office of Urban Affairs of the American Council on Education (Washington).

Periodicals. There are a number of agencies which are not engaged in research, but contribute to the dissemination of current information through periodical publications. Prominent among these is Sage Publications. This agency's *Urban Affairs Quarterly* and *Urban Research News* are useful sources of information in Canada. So also is the series *Urban Affairs Annual* which presents informed commentaries on varying themes of urban issues. Sage is North American agent for *Urban Studies* (Glasgow).

Some publishers make an effort to cater to a Canadian audience, as do some of the professional and research agencies. For example, *Current Municipal Problems*, published by Callaghan and Company, uses on a continuing basis – with permission – articles from the *Northern Miner* (Toronto), and *British Columbia Government News*.

Periodicals subscribed to in Canada in the above category include, as additional examples, *Downtown Idea Exchange, American City, Architectural Record, Traffic Quarterly* (ENO Foundation), *Urban Affairs Reporter* (Commerce Clearing House, Chicago).

Periodicals originate also from government agencies, universities, private and public research institutions, professional bodies. Many Canadians subscribe and use such sources.

United Kingdom

The United Kingdom ranked second in importance among the foreign countries providing urban information to Canadian provincial and municipal departments, and third after the United States and France as a source of reference in a sample of studies sponsored by the Canadian Council on Urban and Regional Research.

1. University Publications

The most widely used source was the quarterly *Town Planning Review*. Almost every respondent from a planning department which reported foreign non-United States sources included this periodical. This is a quarterly of international scope, published by the Department of Civic Design (Town and Regional and Transport Studies) of the University of Liverpool.

Reports from research centres in the United Kingdom are used in Canada. The Centre for Environmental Studies (London) publishes its *Working Papers* one set of which is related to its research program in the planning and design of the physical environment. Another set, *University Working Papers*, reports on studies done outside the Centre. The Centre also edits *Environment and Planning*, a quarterly which deals with urban and regional research and planning methodology. A Centre for Urban Studies is associated with University College London.

Results emanating from university research activities in the United Kingdom are frequently issued through irregularly published reports or occasional papers. There is no co-ordinating source for ready access to these reports. A few universities sponsor regular periodicals which are subscribed to in Canada. The

Department of Town and Country Planning of the University of Durham at Newcastle publishes the twice yearly *Planning Outlook* which covers research activities of the Department and other institutions. The London School of Economics puts out a *Journal of Transport Economics and Policy*. Issued three times per year, this journal is international in scope and presents comprehensive articles on all aspects of transport. *Urban Studies*, edited in the Department of Social and Economic Research, University of Glasgow has also been cited among the sources used.

Some other universities whose reports have been identified as being used are: University of Reading (Department of Economics); University of Birmingham (Centre for Urban and Regional Studies); University of Manchester (Department of Town and Country Planning); University of Edinburgh (Planning Research Unit, Department of Urban Design and Regional Planning).

2. Association Publications

The Town Planning Institute, whose monthly *Journal* was frequently cited, stands out as a link with the United Kingdom. The Institute has compiled a *Planning Research Register* with the assistance of the Royal Institution of Chartered Surveyors, the Royal Institute of British Architects, and the Institute of Landscape Architects. The latest *Register* records all research in town and country planning and its related fields started or completed by local planning authorities, universities and research institutes in Great Britain between 1964 and 1967.

Among professional periodicals, the monthly *Architectural Design* and quarterly *Community Development Journal* were also noted. Canada is third in the number of international subscribers to the latter journal.

3. Government Agencies

At the level of the government, three agencies appear to play significant roles as sources of urban information in Canada. One is the Building Research Station of the Ministry of Public Building and Works. Through the *BRS News*, the Station reports on its research activities including publications arising from its projects. The Building Research Station works in co-operation on some projects with the other key agency for our purposes, namely, the Ministry of Housing and Local Government. Research results arising from the Station's activities are published mostly as separately issued bulletins and reports by H.M. Stationery Office. Two sources which do not seem to be much used here but which serve as guides to research activities in the United Kingdom are the *Classified Accessions List* and the monthly abstracting *Index to Periodical Articles* published by the Ministry of Housing and Local Government's Library.

Another government agency is the Greater London Council. The Research and Intelligence Unit of the Department of Planning and Transportation publishes a *Quarterly Bulletin* which provides useful information on research activities and developments.

4. Planning and Transport Computation Co.

PRTC, London, is an independent nonprofit company set up by a number of university interests in the United Kingdom, and controlled by its members. It is active in the field of computer applications to traffic and transportation planning, seeking to initiate development, as well as to disseminate information and to facilitate exchange among its members and other interested parties.

Data handled by the Company reflect the results of its own research, as well as those of subscribing members. Much information is also forthcoming from the conferences and seminars sponsored by PRTC, proceedings of which are often printed for general information.

The Company concentrates on current data and provides a communication framework to facilitate the exchange of ideas as well as the development and dissemination of information in its field. In addition, it makes a contribution to access to retrospective data by setting up a data bank of programs.

A significant proportion of the United Kingdom support for PRTC comes from local government bodies. Of the 27 U.K. institutions represented at the 1969 Conference, 14 were from local governments, and 9 from universities.

While North American participation in the activities of PRTC does not appear to be very strong, this Company is illustrative of the links that need to be explored abroad in order to lead to more co-operative sharing of developments and experience.

France

1. Publications

A general source of information is the bi-monthly periodical *Urbanisme* which covers the areas of planning, urban development and housing. The Conseil National des Economies Régionales et de la Productivité serves as a source of information through its bi-monthly journal *Expansion Régionale. Bulletin S. M.U.H.* of the Secrétariat des Missions d'Urbanisme et d'Habitat is a source, but contains information mostly of interest to developing countries in the French Union.

2. Centre d'Etudes du Tourisme

The Centre d'Etudes du Tourisme (Paris) is a dynamic agency whose structure allows for representation from the principal academic disciplines, national, regional and local government authorities, professional organizations and both French and foreign individual participation. Three periodical publications are

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ut out by the Centre: *Etudes et Mémoires, Les Cahiers du Tourisme* and *Documentation Touristique: Bibliographie Analytique Internationale.*

3. CEDERCOL

Another agency is the Centre de Documentation et de Recherche sur les Collectivités Locales (CEDERCOL). This agency is attached to the Fondation Nationale des Sciences Politiques, and publishes a quarterly *Bulletin de Documentation du CEDERCOL — Collectivités Locales.* The bulletin presents analyses of recent work; an index of articles on urban affairs from the major newspapers in France; and classified annotated entries of new acquisitions.

4. S.T.C.A.U.

Much of the urban and regional research effected in France is done by private institutes, sometimes sponsored by government departments. The Ministère de l'Equipement et du Logement performs a centralizing role in information on urban research through the Centre de Documentation of its Service Technique Central d'Aménagement et d'Urbanisme (S.T.C.A.U.).

The Centre serves as a co-ordinating source of urban and related information in France. It functions at the international level by alerting interests in France of related activities abroad and by informing foreigners of urban activities in France.

Information services of the Centre de Documentation are the following:

- a service "question-response" or "S.V.P."
- periodical publications: **(a)** *Liste Commune d'Acquisitions* **(b)** *Bulldoc*
- a Thesaurus.

The *Liste Commune d'Acquisitions* is a classified bi-monthly accessions list of approximately 600 entries reporting items received by S.T.C.A.U. and the following urban-oriented institutions in France:

- Atelier parisien d'Urbanisme
- Bureau central d'Etudes d'Equipement d'Outre-Mer (B.C.E.O.M.)
- Bureau d'Etudes et de Réalisations urbaines (B.E.R.U.)
- Centre d'Etudes et de Recherches sur l'Aménagement urbain (C.E.R.A.U.)
- Centre national d'Etudes et d'Initiatives en faveur du Logement (C.N.E.I.L.)
- Centre de Recherche d'Urbanisme (C.R.U.)
- Centre scientifique et technique du Bâtiment (C.S.T.B.)
- Centre de Sociologie urbaine (C.S.U.)
- Compagnie d'Etudes industrielles et d'Aménagement du Territoire (C.I.N.A.M.)
- Délégation à l'Aménagement du Territoire et à l'Action régionale (D.A.T.A.R.)
- District de la Région de Paris
- Institut d'Aménagement et d'Urbanisme de la Région parisienne (I.A.U.R.P.)
- Institut national d'Etudes démographiques (I.N.E.D.)
- Laboratoire d'Etude de Sociologie du Travail (L.E.S.T.)
- Office central interprofessionnel du Logement (O.C.I.L.)
- Omnium Technique d'Etudes Urbaines (O.T.U.)
- Organisme régional d'Etudes de l'Aire métropolitaine de Marseille (O.R.E.A.M. Marseille)
- Organisation Générale des Consommateurs (ORGECO)
- Secrétariat des Missions d'Urbanisme et d'Habitat (S.M.U.H.)
- Service d'Etudes techniques des Routes et des Autoroutes (S.E.T.R.A.)
- Société centrale pour l'Equipement du Territoire (S.C.E.T.)
- Société centrale immobilière de la Caisse des Dépôts (S.C.I.C.)

For some of the above institutions, such as C.S.T.B., only selected acquisitions are included.

The monthly publication *Bulldoc* is the main organ by which S.T.C.A.U. seeks to inform in a general sense on urban and related activities in France and abroad. The publication attempts, moreover, to develop an exchange of ideas between readers and contributors.

Information retrieval operations at the Centre are carried out manually, but plans are under way for the introduction of an automated system. Until operations are automated, the Thesaurus will not be used to its full potential. An automated system will be an advantage not only to the Centre de Documentation, but as a part of its information system would reduce the time lag now experienced before items are recorded in the *Liste Commune d'Acquisitions.*

Other Countries

There are few other countries which have been identified as providing sources of urban information in Canada. Almost every respondent from a planning department which subscribed to foreign periodicals outside the United States subscribed to the monthly journal *Ekistics* (Athens) which reprints and abstracts from a wide international range of sources. The *Ekistics Index* presents cross-referenced articles from 600 periodicals of 50 countries.

Sweden offers much urban information through the National Swedish Institute for Building Research. The Institute has research departments of town planning, building climatology, production techniques and economic analysis. Its research reports are often published with English summaries. As of 1970, the Institute is sending copies of all its publications to one or a few organizations in any country to make them accessible to borrowers. The National Research Council of Canada has a large number. The "Exchange of Research Programmes" cards with information on current activities at the Institute are published in English and are very useful to research departments.

The Danish periodicals *Landskap* (Havekunst) of the Danish Building Re-

search Institute, is used in a number of departments of landscape architecture and planning.

One Italian source is the *International Review of Community Development* (the international edition of *Centro Sociale*). The *Review* displays an interest in principles, methods and evaluation of community development projects, and places emphasis on problems of popular participation and animation.

Japan has contributed in urban development through the Japan Centre for Area Development Research, and its publication *Area Development in Japan.*

From Latin America, mention has been made by users of the *Boletin Officina Sanitaria Panamericana.* An active Latin American institution in the field of documentation is the Servico Federal de Habitação e Urbanismo of the Ministry of the Interior, Brazil.

The Philippines has sought to report on environmental planning and related activities, through the *Philippine Planning Journal,* published by the Institute of Planning of the University of the Philippines.

In Eastern Europe, the Canadian Council on Urban and Regional Research has exchange arrangements with the Hungarian Institute for Town and Regional Planning and Research which performs a wide range of activities in area and community research, planning and development, as well as in information services. Another source of contact is the *American-Yugoslav Project in Regional and Urban Studies Newsletter.* This is an occasional newsletter published in English and Serbo-Croatian in Yugoslavia by the Urbanisticni Institut SRS.

Other overseas agencies are:

- Australian Institute of Urban Studies
- Department of Socio-Economic Research, Ministry of Housing, Israel
- Centro di Documentazione d'Ingegneria Civile, Architettura et Pianificazione Territoriale, Italy
- Town and Country Planning Department of the Research Institute for Building and Architecture, Czechoslovakia
- Institut für Orts-, Regional und Landesplanung, Switzerland.

Appendix E The Toronto Area Research Conference

The Toronto Area Research Conference came into being in early 1960. It is primarily a forum in which people from various organizations in the Metropolitan Toronto Area who are interested in its economic development can meet each other and exchange views on problems and methods of mutual interest. Its objectives are "to promote and co-ordinate research by public and private bodies into the population and economy of the Metropolitan Toronto Region and to facilitate the interchange of statistical information, methods and findings".

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Mr. James Spence,
Toronto Board of Trade

Organizations Represented in TARC

- Bell Canada
- Bureau of Municipal Research
- Canadian Council on Urban and Regional Research
- Canadian Imperial Bank of Commerce
- Central Mortgage and Housing Corporation
- Consumers' Gas Company
- Damas & Smith Limited (Consulting Engineers and Planners)
- Dominion Stores Limited
- Dunlop, Wardell, Matsui & Aitken (Architects and Consulting Engineers)
- Eaton's of Canada Limited
- Electrical Contractors Association of Ontario
- Goodyear Canada
- Gulf Oil Canada Limited
- Haldimand-Norfolk Study
- Metropolitan Toronto Hospital Planning Council
- Metropolitan Toronto Library Board
- Metropolitan Toronto Planning Board
- Metropolitan Toronto School Board
- North York Board of Education
- Ontario Housing Corporation
- Ontario Hospital Services Commission
- Ontario Hydro
- Ontario Institute for Studies in Education (Department of Educational Planning)
- Ontario, Province of: Department of Highways; Department of Municipal Affairs (Community Planning Branch and Assessment Standards Branch); Department of Treasury & Economics (the Deputy Treasurer and Deputy Minister of Economics and the Regional Development Branch)
- Proctor, Redfern, Bousfield & Bacon (Consulting Engineers and Planners)
- Scarborough, Borough of: Board of Education; Planning Board
- Solmon, Feldstein, Rich & Company (Chartered Accountants)
- Social Planning Council of Metropolitan Toronto
- Speedy Muffler King
- Steinberg's Limited (Ontario Division)
- Toronto, City of: Planning Board; Public Library Board
- University of Toronto: Department of Urban and Regional Planning
- Woods, Gordon and Company (Management Consultants)
- York University: Faculty of Environmental Studies; Institute of Behavioural Research

Appendix F Some Selected Methods and Techniques Applicable to Urban and Regional Information Use

The rise in urban populations in all major countries since World War II has pointed to the necessity for improvements in urban and regional information transfer. These improvements are needed because:

- there is a vast increase in the amount of available information
- the information needed must be supplied in the shortest possible time after the request has been made
- the information must be relevant
- the information transfer process must permit the user to be selective
- the information transfer should be carried out at the lowest possible cost.

As a result of this, there have been many new developments in improved information handling technology in recent years. Many of such improvements, but not all, are related to the use of computers in information handling.

Indicative of the growing awareness of this changing situation is the interest shown in developing computer-based internal municipal information systems (for example, in Edmonton and Calgary), and the intention of the federal government to consider whether or not to sponsor a central agency to plan, finance and supervise a country-wide computer-communications network.

This Appendix outlines briefly some of the techniques that are available to help develop improved urban and regional information services in Canada.

Geo-coding

Urban geo-coding is a technique to file and retrieve data by an address (or real position in space) rather than within a larger area, such as an enumeration district, traffic zone, planning area or the like.

The geo-coding system's characteristic is the definition of an address by means of an x-y coordinate related to a standard grid map system.

Some of the advantages of such a system are the:

- flexibility as to the aggregation of data within different areas
- use of the material for new and different purposes independent of the original data systems
- ability to assemble data in graphic display produced mechanically.

Difficulties are the costs of developing a:

- directory system based upon the system of street addresses so that each address can be identified by a specific coordinate
- grid coordinate-to-polygon program for data retrieval and summarization purposes so that specified areas, identified by the coordinates of their vertices, can be defined for specified purposes (e.g. Census tracts, traffic zones), and the area addresses and data within the polygon considered as one unit.

The special impetus in Canada for the adoption of geo-coding systems is the introduction of the Dominion Bureau of Statistics Geographically Referenced Data Storage and Retrieval System (GRDSRS) in the tabulation of the 1971 Canadian urban Census returns. Present objectives call for geo-coding 14 metropolitan areas, providing that the local municipalities are prepared to supply the required input information.

Selected Developments in Information Technology

The following sample of techniques, explained in brief, are representative of the potential for improvement in information handling. They do not indicate the whole potential of a rapidly expanding technology:

1. Electronic data processing systems

Generalised Information System (GIS). This is a computer programme that is capable of storing large amounts of data and can also deal with many terminals simultaneously. Questions can be put using typewriter-type console connected to the computer via the telephone system. This system is particularly useful for search from a large data file, so that the required information can be delivered quickly.

Computer-printed Book Catalogs. These have proven successful where the items to be listed can be adapted to computer handling. The have not been successful when used by enthusiasts for the wrong purposes.

Closed-circuit Display. This method allows the transmission to visual display receivers of material stored on film or in computer memory. An increasing amount of effort to develop on-line information systems in Canada is taking place.

2. Microfilm

Microforms. A widely accepted form is microfiche (60-90 frames on a film 48 by 105 mm). This enables a document of many pages to be reproduced on one sheet and to be mailed easily. Microfilm is particularly suitable for storage for later duplication as required.

Mechanical Retrieval of Microfilm. All functions of municipal government share a common requirement for filing and retrieving information. One solution is to use various microfilm filing and retrieval systems, which have the capability of retrieving information quite rapidly.

Facsimile Tele-copying. With the advent of improved transmission and copying devices, it is now possible to copy at a distance over leased telephone lines. One present disadvantage is that this method is relatively costly, so that it can

be used economically only for the transmission of highly important documents.

Time-sharing on Wire. Some major opportunities for savings in information distribution and interoffice communications are being developed, mainly through cost reductions in telecommunications services. Among the techniques which will become more generally applicable at acceptable cost are:

- time-sharing of transmission by wire through the application of improved multiplexing techniques (these permit users to put more than one signal at a time into a specific transmission wire)
- an increasing variety of terminal equipment at reasonable prices, permitting transmission of documents, photographic images, voices or data
- increasing flexibility in telecommunications companies' rates and policies.

Appendix G Summary Report of a Regional Co-operative Computer Plan*

Background

In 1967, the Metropolitan Fund of Detroit, concerned with the optimum utilization of electronic data processing among the governments in the six county Southeast Michigan metropolitan area, sponsored a research project with three objectives:

a. secure basic information on the extent of utilization of computers (in municipal services);

b. analyse the effectiveness and impact of existing and proposed computer systems; and

c. develop recommendations which could promote the orderly and efficient future use of automated equipment for government services and functions, based on the principle of voluntary intergovernmental co-operation.**

The 1967 survey revealed that comparatively few local governments had installed computers, and that such systems were usually not fully and effectively employed. The major problems were the shortage of qualified personnel and the limits of individual governments applications, which did not keep the equipment in operation for the minimum economic rental time. Another significant finding was the widespread purchase of computer capabilities by local governments from both inside and outside the public sector. Dozens of contractual arrangements were entered into for continuing or one-time data processing services.

One of the major recommendations of the Fund's first research project on computers was that "an intensive study should be made to explore the feasibility of the adoption in some form of the service centre concept as a means of utilizing the advantages offered by automated equipment". The report continued:

Although there is no single solution to the question of how to best integrate computers into governmental activities in order to achieve optimum savings and efficiency, serious and thorough consideration should be given to bringing computer benefits to jurisdictions presently without adequate justification due to volume. As is increasingly evident, a governmental unit can secure the benefits of computers without the operational headaches through the service centre or service bureau.

The summary material in this Appendix is taken from Stitelman, L., *Regional Cooperative Computer Plan*, A Research Project by Metropolitan Fund, Inc., 211 West Fort Street, Detroit, Michigan 48226, February 1970.

**Automation in Government: A Computer Survey of the Detroit Metropolitan Region*, Leonard Stitelman; November, 1967, Metropolitan Fund, Inc., Detroit, Michigan.

In late 1968 and early 1969, the Metropolitan Fund, in co-operation with the Southeast Michigan Council of Governments (SEMCOG) and the Michigan Municipal League, sponsored a series of four Computer Forums held throughout the Detroit metropolitan region. All government jurisdictions with computer systems made presentations on the nature of their applications. These Forums served as the most effective platform for the exchange of information on EDP among present and potential government users ever held in the Detroit Region.* They also served as a stimulant, along with the Metropolitan Fund's initial research study, for the steps which led to the preparation of this report on the *Regional Co-operative Computer Plan.*

In December 1968, the Southern Wayne County Mayors Association, chaired by Mayor James de Sana, of Wyandotte, requested the Metropolitan Fund to conduct a study on the feasibility of these governments joining in a co-operative computer service effort. A letter of intent to co-operate, signed by a representative of each community, accompanied the request. The mayors' proposal stated:

*Joint use of one large computer centre by eighteen small communities** could reduce the total burden of the co-operating communities in establishing, organizing, staffing, equipping and operating the centre. It would enable the communities to compete with other computer users in recruiting and retaining qualified technical people. It would lower units of cost for computer services, and permit installation of more sophisticated systems to better serve the communities' needs.*

The study should determine if it is economically practical to service the communities initially in such applications as payroll, water billing, property taxes

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*The presentations were summarized and published as a monograph, see *Proceedings of Southeast Michigan Detroit Region Computer Forums,* edited by Leonard Stitelman with assistance from Dennis L. Little; July 1, 1969, Metropolitan Fund, Inc., Detroit, Michigan.

**Communities	Population	Communities	Population
Dearborn Heights	78,700	Ecorse	18,400
Westland	73,700	Melvindale	15,000
Taylor	61,500	Riverview	10,200
Lincoln Park	58,400	Grosse Ile	8,000
Wyandotte	44,700	Brownstown	7,000
Allen Park	43,500	Flat Rock	5,500
Southgate	33,700	Gibraltar	3,500
Trenton	22,000	Rockwood	3,300
River Rouge	18,700	Woodhaven	1,200

and voter registration. Longer range goals for EDP systems could be the implementation of public safety, general accounting and budgetary accounting. An ultimate goal is a real time management information system with terminals located in all those communities requiring this type of service.

Strong support of the proposal was also expressed by the Southern Wayne County Chamber of Commerce, a co-operative association of over 600 businessmen in 12 communities.

Summary of Conclusions and Recommendations

The following are the main recommendations of the feasibility study published in 1970.

1. The sharing of a central computer system to service a group of local governments on a multi-application basis is technically sound and economically feasible.

2. A co-operative computer service would provide significant improvements over present methods of information handling, and would definitely assist the communities in their administrative, managerial, and service functions.

3. The cost of an improved co-operative system, will be no more than, or less than, the cost of present, less effective operations.

4. The implementation of a co-operative system should be considered on an incremental basis — a short range phased conversion to electronic data processing, and future planning for computer services in an installation controlled by or operated by the communities being serviced.

5. A decision by each community to seek computer capabilities on an independent basis would result in a substantial waste of tax dollars. Equal but separate computer facilities for each community would considerably increase costs and provide less service.

6. A co-operative computer service centre in Southern Wayne County can serve as a model for other clusters of governments in the Southeast Michigan region.

7. A central computer system need not lead to conflicts in scheduling of services for each community, assuming the use of third generation equipment.

8. Essential elements of privacy of data which each community may desire can be achieved.

9. The acceptance of a co-operative working relationship by each political jurisdiction is essential for the success of the service centre concept.